THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal ESTABLISHED 1835 · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · THE RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (6 lines)

Annual subscription payable in advance and postage free:
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 65. No. 21 FRIDAY, NOVEMBER 20, 1936

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Engineering and Exporting

AT a meeting in London of the Institute of Export on November 10, Mr. Rolt Hammond delivered a paper in which he reviewed the progress of recent engineering with special reference to the export trade. To illustrate his points he described four representative British achievements overseas: the Sydney Harbour bridge, the Lloyd barrage, the Cauvery Mettur dam in India, and the Iraq oil pipe-line. In these great works British plant, materials and skill had been used, including the latest developments in metallurgy, welding, and the products of the machine tool industry. Mr. Hammond concluded by quoting the peroration of Sir Alexander Gibb's recent presidential address to the Institution of Civil Engineers, suggesting the substitution of the word "exporter" where Sir Alexander Gibb had used "engineer":—

> I would like it to be possible for one policy to inspire and guide all classes of engineer. I would hope that in time there would arise a body of engineering opinion so weighty, so authoritative, so sure, so sane, that it would prevent waste of energy and misplaced enterprise, and would inevitably command attention in the politics and administration and life of our country and our Empire.

It is important in this connection not to neglect consideration of the ultimate results of current financial policy in demanding of every industrial country that its exports should exceed its imports. Is it the purpose of the Institute of Export to further this policy? It is not the policy of engineers as such.

New Railway Receiving Offices

For many years the four main-line railway companies have had shops or offices in the principal streets of London and other towns. Sometimes different companies have had two or more offices in one street. Realising this was not an economical arrangement, the companies decided to combine their offices. An architectural competition was held, three eminent architects and the Public Relations Officer of the Southern Railway being appointed as judges, and four prizes ranging from £300 to £25 were offered. Last Monday these prizes were awarded at the Royal Institute of British Architects, where the winning designs will be on view until November 25, and on page 864 we illustrate the first three prize-winning designs. The design awarded first prize is a neat modern treatment, to which our illustration does not do full justice, as it does not give the judiciously placed spots of colour that enliven the drawing. But the design, though it strikes a modern note, is restrained, and should fit in well with almost any background; the three plans accompanying the design show evidence of careful study of the requirements of a railway receiving office. The design placed second is more ambitious but has not the quiet distinction of the first design. The third design is very consciously modern, indeed a rather typical but excellent specimen of the orthodox modernist school of architectural design. The assessors highly commended several other designs. We think they have done their judicial task wisely and well.

* * * *

The Week's Traffics

A net increase of only £37,000 is shown in the traffics of the four main line railways for the past week, the low figure being due entirely to the coal receipts which compare with big takes at this time last year. Passenger train earnings provide an increase of £45,000. For the year to date the respective passenger train percentage advances are: L.M.S.R. 2·56, L.N.E.R. 2·16, Southern 2, and Great Western 1·98. In general merchandise earnings to date the L.M.S.R. increase is 5·87 per cent., that of the Great Western is 4·23 per cent., and that of the L.N.E.R. is 3·48 per cent. The traffics of the four companies together for the 46 weeks amount to £138,307,000, an increase of £4,405,000, or 3·29 per cent.

	46th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	+ 16,000	+ 18,000	− 11,000	+ 23,000	+ 2,198,000	+ 4·08
L.N.E.R. ..	+ 5,000	+ 6,000	− 14,000	− 3,000	+ 1,245,000	+ 3·16
G.W.R. ..	+ 11,000	+ 5,000	− 11,000	+ 5,000	+ 590,000	+ 2·62
S.R. ..	+ 13,000	+ 2,000	− 3,000	+ 12,000	+ 372,000	+ 2·05

Mersey Railway traffics for the past week show an increase of £236, making the increase to date £2,786.

* * * *

Travel Facilities for M.P.'s

Since 1924 the travelling facilities granted to Members of Parliament have enabled them to make periodical journeys by railway between London and their constituencies free of charge. While they were entitled to first class travel, however, it was not until 1931 that, in order to meet the convenience of members making long night journeys, it was decided that they should be allowed to use third class sleeping accommodation, where available, provided that the total cost of the third class fare plus the charge for the sleeping berth did not exceed the first class ordinary fare or tourist fare where such was in operation. Subsequently it was agreed that third class Pullman accommodation could be used on the same conditions. Recently, however, to meet further representations from M.P.'s, the Treasury has agreed that they may use first or third class sleeping accommodation, and

also travel free by such special trains as the Silver Jubilee or Queen of Scots for which a supplementary charge is usually made in addition to the fare. Vouchers may also be obtained now entitling members to use sleeping accommodation when travelling by night on railway steamship routes.

* * * *

Overseas Railway Traffics

Gross traffics of Argentine railways have continued on the up grade during the past fortnight, with the exception of those of the Cordoba Central. Increases in both weeks have been shown by the Buenos Ayres Great Southern which during the fortnight has reduced its previous decrease by £15,442. During the same period the Buenos Ayres & Pacific has added £11,940 to its previous increase, and the Buenos Ayres Western has added £4,628. Central Argentine receipts again make far the best showing, with an additional gain of £49,595 during the two weeks.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	20th	80,412	7,557	1,499,282	26,385
Buenos Ayres Great Southern ..	20th	124,176	11,250	2,212,843	162,206
Buenos Ayres Western ..	20th	46,001	877	803,114	19,709
Central Argentine	20th	139,869	23,185	2,749,129	393,612
Canadian Pacific	46th	561,000	31,000	24,094,200	1,655,000
Bombay, Baroda & Central India	3rd	225,525	7,650	4,923,825	178,425

Brazilian railway traffics are again better. The San Paulo registers an increase of £213,185 for the 45 weeks of the current year, and for the 46 weeks the Leopoldina is up £80,249 and the Great Western £6,500.

* * * *

Scope of the New Canadian Department of Transport

Addressing the Canadian Club at Montreal on November 2, Mr. C. D. Howe, Minister of Transport, announced that a new Department of Transport, under him as Minister, had been established as from that date. It took over the work of the former Departments of Railways and Canals, and Marine, and the Civil Aviation Branch of the Department of Defence. Co-ordination of transport, more efficient services, and reductions of staff are expected to result from this new move. The Department of Railways and Canals dated back to 1879. Through the Board of Railway Commissioners the department administers the Canadian Railway Act, and so the Minister has relations with all railway companies incorporated under Federal Charter. It also has a special responsibility towards Government-owned lines and administers all the harbours in the Dominion, including some 800 docks on the coasts of the oceans and great lakes. The Canadian Travel Bureau for developing tourist traffic is one of its activities, as also is radio broadcasting. One of the first cares of the newly-constituted department is the establishment of a transcontinental air service for passengers and mails, and another is the co-operation with Great Britain in the proposed North Atlantic service via Ireland and Newfoundland to Montreal, which should be in operation by 1938.

* * * *

The Problem of the Canadian National Railways

Mr. Howe, in his address referred to in the foregoing note, stated that the most serious problem confronting his department was the welfare of the Canadian National Railways. Now that such keen competition exists with other forms of transport, the railways accept the situation that the public is entitled to whichever kind of transport is the most efficient, and that their own future depends upon the quality of service they can provide. At the same time the Government has been impressed by the degree to which the railways are subject to regulation as compared with the complete absence of regulation of competing forms of transport. It therefore intends to remedy matters by converting the existing Railway Commission into a Transportation Commission, as the rate-controlling and regulating body for all forms of transport. In this way it is hoped that fair competition in the general field of transport will be ensured, and that more efficient operation and avoidance of duplication of services will prevent transportation being a drain on the public purse. In spite of her vast area and sparse population Canada already enjoys the cheap transportation so essential for her national economy, but very careful operation is necessary to convert the deficit of the railways into a surplus.

* * * *

Sir Charles Parsons and Steam

The invention of the steam turbine is always associated with the name of the late Sir Charles Parsons and with the River Tyne, on the banks of which so much of his pioneering work was carried out. It was, therefore, appropriate that the first Parsons Memorial Lecture should have been delivered in Newcastle before the North-East Coast Institution of Engineers and Shipbuilders. Actually, Sir Charles Parsons is a national figure and the arrangements for honouring his memory, which have been made by the Royal Society, comprise a memorial in Westminster Abbey, a Memorial Library in London House, and an annual lecture which every fourth year is to be delivered on the North-East Coast, but otherwise in London. The honour of being the first to give the memorial lecture fell to the lot of Sir Frank E. Smith, the Secretary of the Royal Society and the Secretary of the Department of Scientific and Industrial Research, and on November 6 he took as his subject " Sir Charles Parsons and Steam " and gave a fascinating survey of steam power from earliest days to the evolution of the turbine. In connection with the memorial lecture a Parsons exhibition has been arranged at the Municipal Museum of Science and Industry, Newcastle-on-Tyne, which will remain open until January.

* * * *

Air-Conditioning

The first air-conditioned coaches in the British Empire were placed in service on the Victorian Railways about a year ago and were described in THE RAILWAY GAZETTE of April 3, 1936. So popular have they proved that air-conditioning equipment is to be installed on many more passenger vehicles in Victoria, and we predict that it will not be long before air-conditioning becomes as common in certain countries where climatic conditions are extreme as it is already in the United States. An ingenious demonstration staged at Birmingham this week and attended by numerous railway and other visitors from all over the country has brought home the benefits of this system of railway carriage ventilation. A new coach (described on page 855) for the Federated Malay States Railways equipped with air-conditioning plant was enclosed in an insulated compartment in the works of the builders; the air-conditioning plant was set to work, and the visitors, having experienced the almost tropical heat artificially generated in the compartment, were admitted to the interior of the vehicle. Whereas outside the temperature had been over 90° F. and the humidity 68 per cent., inside the temperature was only 72° F. and the humidity 58 per cent. In other words those who had taken part in the demonstration passed from an unpleasantly hot and moist atmosphere to one that was thoroughly congenial. We can well imagine that, with the placing in service of these coaches in Malaya, travelling, instead of being an experience to avoid, will become such a pleasure that many will find excuses for a railway journey simply to enjoy the atmosphere. Although the cost of

air conditioning equipment is appreciable, it has been estimated that all additional charges in respect of it are covered by one extra passenger on an average trip. As the windows and doors of an air-conditioned coach are kept closed, draughts, dust, and soot are absent, while noise is minimised.

* * * *

Air-Conditioning Attempts 85 Years Ago

During the past few years we have had occasion many times to refer to the notable progress in air-conditioning railway carriages which is taking place on the other side of the Atlantic. In this direction, as in earlier years with the introduction of sleeping cars and carriage heating the long distances covered by many trains in the U.S.A. have acted as a spur to the provision of increased passenger comfort. It is probably very little known, however, that eighty-five years ago attention was paid to the condition of air in railway carriages, but, as long ago as October 2, 1852, *The Builder* recorded that a new ventilating apparatus had been applied to some of the American railway cars. It consisted of two parts, one for withdrawing the foul air and another for replacing it with pure air. The withdrawal was effected simply by opening the car windows outwards like doors towards the back of the car, so that the rush in the external air, while the car was travelling forward, would "have a tendency to exhaust the air within the car, by traction as it were towards itself—in fact by the tendency to exhaustion perpetually sustained at the point of exit." The other part of the apparatus consisted of an orifice in the roof of the car, so fitted up with perpendicular tubes pointing down into a vessel of water that the air could have entrance only through the tubes and by impinging on the surface of the water and escaping over the rim of the vessel into the interior. By these means it was calculated that the air would be entirely freed of dust, and delivered in a pure state to the interior of the car, into which the exhaustion of the foul air would tend to draw it in a continued stream so long as the car was in motion.

* * * *

Bricks for Railway Use

Two interesting and instructive papers were read last Tuesday before the Ceramic Society in London on the subject of bricks for railway use by Messrs. Seaton, of the L.N.E.R., and Rock, of the Southern Railway. We briefly summarise the main points in these papers on another page. Mr. Seaton struck what seemed to be a note of regret at the modern ubiquity of the Fletton brick. He said all he could in favour of the Fletton, and it cannot be denied that it was a good deal in these days of inverted values when paramount importance is attached to abstractions, and real values are measured almost exclusively in abstract terms. The great advantage of the Fletton is that, while it is sufficiently good for modern standards of building, it is cheap. Nevertheless, the good old London stock brick, incorporated in early construction with good lime mortar and first class workmanship is, as Mr. Seaton showed by quoting examples, as permanent today as the brickwork of ancient Rome. Whether the Fletton will survive the centuries in like manner only the centuries can tell, and in a day when insecurity makes thought for the morrow almost a waste of time, perhaps it does not matter.

* * * *

Efficiency of Mechanised Shunting

When we described the new hump marshalling yard at Hull, L.N.E.R., in our issue of January 24, 1936, we mentioned that it was designed to deal with 2,500 wagons a day though it was expected that upwards of 3,000 could be handled if necessary. That this was not too optimistic an estimate has recently been demonstrated in a seven-hour continuous shunting test made under regular working conditions, including all delays and working stoppages, and with the disadvantage that the day was wet and part of the test was carried out after dark. During these seven hours more than 1,200 wagons were put over the hump, which works out at well over 4,000 for a 24-hour day. This intensive marshalling of wagons is a tribute alike to the designers of the yard, with its excellent floodlighting arrangements, and the various firms who supplied the equipment, including the Frölich hydraulic rail brakes.

* * * *

Electric Signal Lights in Austria

The Austrian Federal Railways have been seeking to improve the efficiency of the signal lights during the last few years, and to reduce the maintenance charges, which were very heavy with the old system of oil lighting and one-day burners. Herr Ortner has described in the press the steps taken to introduce electric lighting. Where an efficient electric supply is available, there is, of course, no great difficulty in doing this, but it is possible only at certain places. Accordingly two systems of low voltage lighting have been developed, and applied to the mechanical signals with good results since 1929. Approach lighting has not been adopted; instead, time switches have been used to switch on the signal lights during certain hours only, according to the period of darkness and the train service. On lines where there is an interval at night without trains, the lights are extinguished during the interval, effecting a considerable saving in energy. A certain number of signals have been fitted with flashlight equipment and accumulators, recharging being necessary on the average every 90 days, while others have been provided with steady lights and primary batteries, as a comparison. As a rule the batteries are found to last about 6 months. The electric lights give a very clear indication and the new arrangements are stated to pay for themselves in about 2½ years.

* * * *

Fissures in American Rails

As yet there appears to be no diminution of the transverse fissure trouble in American rails; the latest figures, indeed, point to an increase in the number of rails which are having to be removed from the track in consequence of fissuring. During 1936 the Sperry detector cars used for the location of fissures covered 7,741 miles of track, and discovered an average of 17·9 fissured rails in every 100 miles of track tested, as compared with 14·4 per 100 miles in 1935, an increase of 25 per cent., and with practically identical car equipment. It must not be assumed, of course, that rails recently rolled are of necessity concerned in this percentage, for most American railway engineers and rail manufacturers are now agreed that by retarded cooling the trouble can be arrested and eliminated at the source. The result is that controlled cooling of rails is gradually becoming standard practice in American mills, and although the method of applying it is not in all cases the Sandberg oven, yet this British firm of engineers is entitled to the credit of having discovered the range of temperature in cooling during which the fissuring is liable to occur, and over which practically all the retarded cooling in America is conducted. The continued increase in American fissure failures may be traced to the greater volume in traffic which has come about with the improvement in American trade, together with much higher average speeds, the result being to accelerate the growth of the fissures in older rails from their original nuclei to the dangerous size which causes failure.

XUM

Long-Distance High Speeds

ONCE again, in the L.M.S. London—Glasgow speed trials of Monday and Tuesday last, the ability of the steam locomotive to maintain a high average speed over a very long distance has been vindicated. The unprecedented time of 5 hr. 53 min. with a seven-coach load from Euston to Glasgow Central, and still more the southbound time of 5 hr. 44 min., which involved an overall speed of precisely 70 m.p.h. with an eight-coach train of 255 tare tons, have proved the practicability of the 6-hr. timing now proposed between London and Glasgow, just as the consistent running for the past thirteen months of the L.N.E.R. Silver Jubilee has shown with what comparative ease the forthcoming Coronation express will be able to maintain a 6-hr. schedule over the East Coast route between King's Cross and Edinburgh. Such demonstrations of speed, however much attention they may attract in the newspapers, are of little value unless they thus issue in definite public service. As evidence of the intention of the L.M.S. authorities to confine these test runs within such limits as would obtain in ordinary running, speed was restricted in general to a maximum of 90 m.p.h., and fifty service slacks of varying severity, were imposed at various points. With these limitations in view, the performance of the 4-6-2 locomotive *Princess Elizabeth* was much more meritorious than the times might suggest, and in particular the climbs over the 915-ft. summit of Shap and the 1,015-ft. summit of Beattock, the former, with its 4 miles at 1 in 75, breasted at 57 m.p.h., and the latter, averaging 1 in 75 for 10 miles, at 56 m.p.h. Remarkable running on the level or slightly adverse grades—steady acceleration up to 95 m.p.h. being achieved on one stretch of dead level—was also a feature of these runs, but more important was the steady running and the general comfort of travel in the coaches.

With little doubt these runs are the fastest that have ever been made in the world by steam power over a non-stop distance greater than 300 miles. Actually the length of run—401½ miles—did not in itself constitute a record, for the same distance was spanned as far back as April 27, 1928, by the same company's 4-6-0 locomotive *Cameronian* when the first portion of the Royal Scot was run without a stop from Euston to Glasgow, though at a considerably lower speed. Moreover, if other forms of motive power be admitted to the comparison, it must be remembered that on two occasions the 1,015 miles from Denver to Chicago have been covered by diesel-engined units without intermediate stop, the second of these being the extraordinary experimental effort of the new eight-car Denver Zephyr, which recently covered the entire distance at an average speed of 83·3 m.p.h. But obviously the diesel engine is better suited than the steam engine, with the latter's limitations of reciprocating motion and of a locomotive firebox, to such continuous high speed as this. In the narrow confines of our own island, however, enormously lengthy non-stops runs are of less importance than the proven ability of the modern British steam locomotive to maintain average speeds of 80 m.p.h. for indefinite distances on the level, and of 70 m.p.h. over entire journeys. It will be remembered in the same connection that during the first month's regular running of the Silver Jubilee, the engine *Silver Link* worked the train daily in each direction for nearly three weeks, so covering 465 miles a day at an average speed of over 70 m.p.h.

A point stressed by the L.M.S. authorities in these speed tests is that they have been made by a standard locomotive and a train of ordinary stock without any assistance from streamlining; it is, in fact, implied that streamlining is unnecessary for high speed running. The same point is endorsed by the L.N.E.R., for the Silver Jubilee, the engine *Silver Link* worked the train daily Pacifics *Papyrus* and *Firdaussi*, and in the former case with a seven-coach train of ordinary stock. But Sir Nigel Gresley made it clear, in his recent presidential address to the Institution of Mechanical Engineers, that apart from the advantage, in high speed running, of lifting the exhaust steam clear of the cab, economy of working rather than additional speed was the purpose behind the streamlining. Careful experiments have shown that the saving due to streamlining on the L.N.E.R. amounts to 4 lb. of coal per mile, and 10 per cent. in power output, which in a year's running of the Silver Jubilee service would amount to some 200 tons of coal. Against this must be set the cost of the streamlining itself—which, however, is small in relation to the total cost of locomotive and train—and the disadvantage of break from standardised equipment, a disadvantage that would probably be commensurate with the extent of high-speed services. In any case, the question of the value of streamlining on railways is so complicated by varying working considerations that to discuss its details here would not be profitable. Much more practical experience will be necessary before anything like a final decision can be reached. Streamlining has, of course, an undisputed publicity value; but what its financial equivalent may be is impossible to determine.

And so, although it has taken 41 years to do it, the records set up by the East and West Coast companies in the Race to Aberdeen of August, 1895, are at length going by the board. It is clear from the L.N.E. and L.M.S. speed trials of 1935 and 1936 that a time of even 8 hr. between London and Aberdeen, did the public demand justify such a service, could without difficulty be maintained, as compared with the 8 hr. 32 min. for the 540-mile journey which represented the high-water mark of speed in the 1895 contest. Of far greater value, however, will be the 6-hr. services between London and the two chief Scottish cities—Edinburgh and Glasgow—that are now definitely in sight, and it is to be hoped that the decision of both railways will be in favour of a late afternoon departure, at 4 or 4.30 p.m. from each end. In the matter of early evening services to distant parts London today is far behind Berlin and Paris, and entirely new extra-fare high speed trains of this description would afford the opportunity of rectifying this deficiency. So far from diverting traffic from other services, such as the sleeping car trains, world experience in general indicates that suitably-timed high speed trains create new traffic by putting it within the power of the business man to transact in person business which he would otherwise entrust to the post.

* * * *

Bengal-Nagpur Railway

IN the Bengal-Nagpur system are included two principal main lines on the 5 ft. 6 in. gauge, one running west from Howrah (Calcutta) to Nagpur, where a junction is made with the Great Indian Peninsula Railway to Bombay, and the other southwards from Khargpur (72 miles west of Howrah) by the east coast to Waltair, where connection is made with the Madras & Southern Mahratta system, and to Vizagapatam. Raipur on the Nagpur line is connected with Vizianagram on the east coast line by a broad gauge chord. Between Howrah and Khargpur the line is double-tracked. Gross earnings for the year ended March 31, 1936, increased by Rs. 56,33,038, or 7·03 per cent., and in working expenses there was an advance of Rs. 30,38,980, or 5·39 per cent., so that net earnings improved by Rs. 25,94,058. Net earnings, however, failed

by Rs. 8,60,949 to meet interest charges, and there are, consequently, no surplus profits to divide between the Government and the company. For the previous year the deficit was Rs. 35,40,881, and there have been no surplus profits since 1927-28. Stockholders receive 4 per cent. for the year under review, the same as for the four previous years, of which 3½ per cent. comes from guaranteed interest and 10s. from reserve. After providing for this dividend the balance of the reserve will be approximately £33,500. Some operating figures are compared in the accompanying table:—

	1935–36	1934–35
Mean mileage worked ..	3,268	3,268
Train-miles	14,667,609	13,820,469
Passengers..	19,349,679	18,904,435
Goods, tons	16,756,605	15,479,307
Operating ratio, per cent.	69·22	70·29
	Rs.	Rs.
Passenger receipts ..	1,60,09,928	1,58,16,397
Goods earnings	6,50,91,165	5,95,43,147
Gross earnings	8,58,11,795	8,01,78,757
Expenses	5,93,99,531	5,63,60,551
Net earnings	2,64,12,264	2,38,18,206

Passenger numbers increased 2·36 per cent. and receipts 1·22 per cent. The advance was mainly in the third class, but first and second also contributed slightly. In general merchandise there was an increase of 944,805 tons and Rs. 51,58,039. Under fuel, the total tonnage of coal carried (7,875,294 tons) was the highest on record, but earnings from coal carried for the public decreased by Rs. 4,01,669, due to reduced mileage, short lead, and concessional traffic being in the ascendant. Manganese ore traffic increased by 322,346 tons and Rs. 24,18,194, and substantial advances were shown in receipts from paddy, rice, iron ore, wrought iron and steel, and limestone. In working expenses there was a decrease of 3·44 per cent. under maintenance of structural works. Locomotive power costs increased by 3·93 per cent. partly because of additional train mileage and the restoration of cuts in pay. A heavier programme for replacements and renewals, which included the provision of 375 four-wheeled covered goods wagons, was the principal reason for the increase of 20·30 per cent. in maintenance of carriage and wagon stock. Capital expenditure during the year amounted to £159,350, which included replacing wooden sleepers with 90 lb. steel trough sleepers, provision of water softening plant, and additional rolling stock.

* * * *

Railway Police

PROBABLY because the nature of their activity requires unobtrusiveness, comparatively little has been published about the work of the railway police, and therefore particular interest attaches to the paper (see page 865) on this subject presented on Thursday of last week to the G.W.R. (London) Lecture and Debating Society by Mr. G. Stephens, the G.W.R. Chief of Police. At the outset he observed that the terms "police" and "constable" were synonymous, and remarked that the word "police" is said to have been imported into this country from France about the beginning of the thirteenth century. The word "constable" was of Norman origin, derived from the Latin *comes stabuli*, *comes* meaning guardian or overseer, and *stabuli* habitation or dwelling. The office of constable is of great antiquity and the present police system is based on the office of parish constables, who were unpaid and appointed by the Courts Leet. It was in 1829 that Sir Robert Peel established the Metropolitan Police, the first organised police body in the kingdom, and ten years later similar organisations were formed in the provinces. Naturally the primary object of an efficient police force is the prevention of crime, and next that of detection, and at the present time the railway police forces are concerned with the same problems as the ordinary police, but with the difference that the former are concerned primarily with the particular interests of their employers, the railway companies.

This was not always the case, for although railway police are as old as public railways themselves, their duties in early years were manifold. On the G.W.R., with which Mr. Stephens was chiefly concerned in his paper, railway police formed the most important class of the company's original staff, and even in those early days they were all sworn in as constables under the Special Constables Act of 1831. Ultimately they were relieved of the duties of permanent-way inspection, ticket collecting, and the work now performed by signalmen and booking clerks. As early as 1838 is found a trace of this specialisation of duty, for in that year an Act was passed empowering magistrates to appoint constables and to debit the railway company with the costs, upon the oath of three credible witnesses that they had reason to fear unlawful behaviour on the part of labourers and others employed on the railway. Later the company obtained special Parliamentary powers for its police, and at the present time all officers are sworn in under the G.W.R. Act of 1877. This Act provides that every person so appointed shall have all the powers, authorities, protections, and privileges in respect of the execution of his duties as constables have, or are subject to, by the laws of the realm. It contains a proviso that, when railway police officers are acting outside the premises of the company, they shall be in all respects subject to the regulations and instructions of Justices or local Watch Committees, and also imposes the penalty of forty shillings if an officer fails or refuses to produce his warrant card when lawfully or reasonably required. Appointments were limited to six in number within any city or town, but the limitation was entirely removed by the G.W.R. Act of 1912. Finally, in 1899, powers were obtained authorising railway police to follow and arrest any person who had escaped from the company's premises after committing thereon or therein any offence for which he might have been arrested.

To-day, therefore, the railway police are possessed of very wide powers, and their authority is far more extensive than is probably realised by the majority of persons. The G.W.R. establishment consists of 360 officers and men under Mr. G. Stephens, and the whole line is divided into four divisions with divisional officers at Paddington, Bristol, Cardiff, and Birmingham, while each division is sub-divided into districts with its complement of inspectors, sergeants, detectives, and constables. The majority of the present uniformed staff consists of constables transferred from the Goods and Traffic Departments, largely because for many years the uniformed branch was controlled by the company's traffic officers. In 1864, consequent upon a Board minute directing Messrs. Tyrrell & Grant to prepare a scheme with a view to promoting greater vigilance in the protection of goods, a special branch of detective officers was formed. From time to time it was thought that the functions of the uniformed branch should be more closely allied to those of the detective branch, and finally it was decided that this could be accomplished by centralising control under the Chief of Police. This unification of forces took place in 1918, and was immediately attended with success. At present there are no resources to put recruits through a course of training. That question, however, has been referred to a committee of the four main-line railways and the London Passenger Transport Board, and a preliminary report has been submitted recommending the establishment of a central school for railway police.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

An Appeal from Cumberland

Cumberland Development Council,
30, Roper Street, Whitehaven.
November 12

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I venture to approach you to secure your interest in the accompanying brochure* illustrating the attractions of West Cumberland as a tourist resort. As you know we are one of the Special (Depressed) Areas, but I believe that it would come as a surprise to most people if they were brought to realise that our depressed towns and villages are set amid such surroundings as those portrayed in this brochure.

Moreover, the modern trend is for industrialists to establish new factories in as pleasant surroundings as possible, primarily, I think, out of consideration for their workers. Here in West Cumberland we can offer factory sites along the coast (with adequate rail and sea transport and other facilities) in settings with natural amenities found nowhere else in Great Britain. And I would stress this, that directors, managers, and other executives could establish their own homes hereabouts very economically, in delightful and easily accessible places, having an inviting social and sporting atmosphere.

Yours, etc.,
W. F. SADLER
Chairman

High-Speed Junctions

"Endsleigh," 9, Strathearn Road,
Edinburgh. November 13

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mr. Bond, in his reply dated November 5, puts in my mouth a number of things I did not say and implications I did not make, or which are the very opposites, and then decorates them with comments such as "negligent," "absurd," and marks of exclamation. As he has taken the initiative in writing to me direct on this subject, I will undertake to make good the above statement in like manner, if he desires it, and relieve you of a profitless dispute.

One or two points, on which he does face the issue, I can deal with here. Switches, so far as I am aware, have always been classified by the planing, and fundamentally they must be, since it governs the equivalent radius. Mr. Bond says it is not so, because he uses D chairs, &c., with E planing. So likewise, I suppose, I can become Mr. Bond by donning his hat and gloves. It was a shrewd stroke on his part to send me the L.M.S. pamphlet to refute my allegation of unorthodoxy. Did he calculate, I wonder, that, even if I found in it statements at variance with established authority, I should hesitate to challenge a publication bearing so august an imprimatur? When I proposed the motor-car as an analogy in principle, I more than half expected he would try, as he does, to ride off on the question of the relative coefficient of friction between rubber on road and steel on steel, and I was prepared with my answer, but he has saved me the trouble by following up his "irrelevant" by going into reverse three lines later and admitting that the cases are parallel. I am glad to hear that he is better acquainted with the actual value of the lateral thrust between flange and rail than I had assumed to be general. I should be tempted to invite him to let the cat out of the bag, but I fear that, following the precedent he has already set, he would tell us that the force was so many inches long and wax duly scornful if I should say that I did not understand him. I decline, on this occasion, to be drawn, as Mr. Bond would apparently like, into a discussion of the desirable maximum cant, the critical climbing speed and the reduction of side wear. My position has been stated with more clearness than, from his anxiety to drag red herrings across the trail, would appear to suit him. I have said that the adoption, which he advocates, of two-level chairs, switches planed straight for 18 feet and the remainder bent to a spiral which is not tangential at the heel, 1 in 16 crossings and 1 in 14 diamonds are not yet, and in some respects never will be, "steps towards" the no-limit junction. I need not repeat the reasoning given in considerable detail in my former letter. Mr. Bond deals with it by damning it holus-bolus and blessing it piecemeal and not only blessing it, but claiming that in his original articles, which ignored or contradicted it, he had it in mind all the time. This brings me to two conclusions, first, that my suggestions can hardly have been so unconstructive as Mr. Bond asks you to believe and, secondly, that his attitude is tactically very strong. I will not imitate his elegant peroration but admit at once that with one foot firmly planted on each side of the fence, his position is unassailable and retire with as much dignity as I can muster.

Yours faithfully,
REGD. PETERS

* See review on the opposite page.

New L.N.E.R. High-Speed Trains

56, St. Mary's Mansions,
Paddington, W.2.
November 17

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Your editorial comment (pages 742 and 743 of the issue of November 6) on the new L.N.E.R. high-speed trains is indeed pleasant reading—particularly its concluding sentences. There is such ample evidence now of the creation of new business by acceleration that fear of injury to sleeping car traffic by a 4 p.m. departure from London to Edinburgh is about as reasonable as the objections—so often raised before and shortly after the grouping—that the present carryings of a particular service did not justify its improvement!

But the fixing of a suitable departure time for the new Edinburgh service will not be an easy matter. Your suggestion of a connection to Scotland off the Silver Jubilee, by a high speed train from Lancashire and Yorkshire to Edinburgh, would appear to involve too late a departure from Leeds. The evening service from Leeds to Scotland has suffered sadly by the loss of the 1.30 from St. Pancras (5.32 from Leeds) and by the earlier running of the 2.20 from King's Cross, for which the connecting departure from Leeds is now 4.6 instead of 5.25. A departure from London at about 4 p.m. for the new 6-hr. train to Edinburgh ought to connect, at Newcastle, with the present 5.30 from Leeds (5 p.m. Hull to Newcastle) and, in spite of its proximity to the Silver Jubilee, and of the fact that no connection could probably be given beyond Dundee, there must be strong commercial arguments in favour of such a timing. The "early in the afternoon" departure, at which you hint, is not so easy to envisage, as anything earlier than 3 p.m. would overtake the 1.20, but if the Queen of Scots is no longer to reign north of Harrogate, or Newcastle, a satisfactory departure time might be found at about 12 noon, making the north connections beyond Edinburgh of last summer's 10.5 from London, or 1 p.m (to link up with the 7.25 Edinburgh to Aberdeen), with a corresponding mid-day departure from Waverley off the 9 a.m. from Aberdeen—a restoration, in fact, of the pre-war summer 12.25. But everything points to the fact that the midday services, which for a 6-hr. journey can hardly be deemed "business" trains, are already adequate, and that it is in the early morning and later afternoon that improvement would be welcomed.

Yours, etc.,
R. E. CHARLEWOOD

PUBLICATIONS RECEIVED

John Stevens : Documents Tending to Prove the Superior Advantages of Rail-ways and Steam-Carriages over Canal Navigation. A Pamphlet of 1812 reprinted under the joint auspices of the Baker Library, Harvard Graduate School of Business Administration, and the Railway and Locomotive Historical Society. Boston, Massachusetts : Baker Library, Soldiers Field. 9 in. × 6 in. Paper covers. Price $1 net.—This is a facsimile reproduction of an interesting and scarce pamphlet of 1812. It appeared originally in the early years of the proposals to make a canal from Albany, New York, westward to Buffalo, and one of the chief aims of the author was to attract the attention of the committee that had been appointed to explore the project of a canal across the State of New York. John Stevens was a pioneer, not only in railway transport, but also in steam navigation, and he made experiments with steamboats, on the Delaware river and elsewhere, in 1804 and 1809. He also secured from the State of New Jersey in 1815 a charter for a railway " from the River Delaware near Trenton to the River Raritan at or near New Brunswick " and this is regarded as the first American railway charter. In 1823 he also obtained from the Legislature of Pennsylvania a charter for a line from Philadelphia westward to the Susquehanna river. These, like other unfulfilled projects, were significant mainly in showing that Stevens was some years ahead of his time. His name came before the public in November, 1928, when there was exhibited in operation, at Hoboken, New Jersey, a working model of the locomotive Stevens built, about 1825, and put in operation at Hoboken on a circular track 200 ft. in diameter ; this is generally accepted as the first locomotive to be run on rails in America. Those responsible for the present facsimile are to be congratulated on having made generally available a document of considerable historical interest relating to one of the great U.S.A. railway pioneers.

Wonderful West Cumberland.—The Cumberland Development Council Limited, 30, Roper Street, Whitehaven, West Cumberland. 14 in. × 10 in. 32 pp., photogravure + map. 2s. 6d.—Too often, it seems, sadness is the complement of beauty, and where nature lets fling with her wildest imagination there men frequently suffer. Such, at any rate, is the state of affairs in West Cumberland, now officially designated a Depressed Area. In writing the introduction to this beautifully illustrated brochure, Mr. Hugh Walpole recalls, in a somewhat wistful mood, the West Cumberland of his childhood. There were afternoons then when, after bathing, he sat, sucking bullseyes, on the shore of Seascale, whence he could see the rounded hump of Black Combe, almost catch sight of the Whitehaven mine shaft, and—looking back over his shoulder—swallow an incomparable view of mountains against the sky. For lakes and mountains, as Mr. Walpole suggests, there is no such thing as time, and if only men too could disregard the passing years, then maybe young Walpole might yet be sitting by the waterside still feasting his boyish mind with these revelations of nature's magnificence. Black Combe is still there ; so is the incomparable backward view of mountains against the sky ; so is the Whitehaven mine shaft ; only the boy is missing. But the memory survives and, now that Cumberland is in the throws of depression, and now that the great wheels at the pit head rest idle, it produces this eloquent endorsement to West Cumberland's brave appeal for the attention of the tourist, the holiday maker, and even the industrialist. The 32 pages of photogravure illustrations which comprise this brochure, of which, incidentally, the full title is " Wonderful West Cumberland—The Stories of its Mountains, Lakes, and Sea," should stimulate in all those it reaches an insatiable desire either to visit or re-visit a quarter of England too frequently overlooked. Those who know and love the beauties of mists, sky effects, water, rocks, steep cliffs, and green valleys should make a point of purchasing a copy of " Wonderful West Cumberland." At least they will have solved the holiday problem for 1937. (See also letter to the Editor on the opposite page.)

Winter Holidays.—Those who are fortunately enough placed to be able to take a holiday at this season of the year, are faced with the choice of two courses. Either they can make the best of wintry weather by embarking upon a week or more of winter sports on the Continent, or they can go further afield in search of summer. Whichever they choose, there is ample inspiration in two booklets which we have received from Dean & Dawson Limited, 7, Blandford Square, London, N.W.1. " Winter Sports " is a guide not only to resorts and prices, but to the equipment the intending participant will require. " Holidays Overseas " deals with passages to, and tours in, Africa, the Americas, Australasia, and the East.

Winter Sports.—The annual winter sports guide issued by Thomas Cook & Son Ltd., Berkeley Street, London, W.1, is, of course, devoted largely to Switzerland, and the facilities, attractions, and accommodation at all the Swiss centres are very fully described and illustrated. Austria, Italy, Germany, the Scandinavian countries, and others further afield are also dealt with from the point of view of the winter sports enthusiast. There are many pages of useful general information calculated to inspire the novice with confidence, and to provide the more experienced visitor with the means of enjoying his next winter sports holiday still more fully. Several full-page cartoons strike an amusing note. With the guide we have received an illustrated folder setting out specially reduced all-in rates (including transport) for holidays at the leading resorts in Switzerland, Austria, and Germany. Reserved rail accommodation is provided for travellers availing themselves of these special excursion train facilities. The crossings out and home are via Dover-Ostend, but reduced all-in charges are also quoted this year for passengers wishing to use the short sea routes from Dover and Folkestone.

Oxygen Cutting and Profiling Machines.—We have received from Hancock & Co. (Engineers) Ltd., Progress Way, Croydon, an illustrated catalogue of oxygen cutting and profiling machines. This equipment is adaptable to every type of machine cutting, and is as suitable for single jobs as for mass production ; generally only a pencil drawing is required, and even a template is quickly constructed as no special allowances are necessary. The electric tracer heads incorporate a.c. or d.c. motors, and allow of four methods of drive—hand-guided from a drawing or blue print ; automatic from a template of strip aluminium ; single roller, semi-automatic from a template of strip aluminium ; and single roller, automatic from a channel template. A feature of the tracers is that they can be detached as a complete unit by the removal of two or three bolts, so that a mechanical breakdown need not hold up the machine. A series of portable machines is included in the Hancock range. All controls are centralised, and, in the case of the larger equipment, duplicated to allow of operation from front or back. The burners are designed to economise in time and oxygen consumption by the incorporation of unit control for the preheating and cutting supplies.

Wires and Cables.—The General Electric Co. Ltd., Magnet House, Kingsway, London, W.C.2, sends an illustrated brochure dealing with applications of Pirelli-General wires and cables. Among the types referred to is a cable specially developed for welding purposes, which has a tough rubber sheathing that will withstand the constant dragging and risk of being trodden upon attendant upon welding operations. For large-scale lighting schemes, Pirelli-General cables have been adopted by many important users. They are at work throughout the new fish dock at Grimsby. Other purposes include street lighting and connections for neon signs. Special attention has been paid by the makers to the production of suitable wiring for shipwork, taking into account such factors as the varying temperatures met with, and exposure to atmospheric conditions. For use in very high temperature installations, continuous research has made available to users of Pirelli-General cables special types of insulation that are not only highly resistant to the effects of such conditions, but also proof against moisture and fire.

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THE SCRAP HEAP

Among the 135 tramway systems in Japan are 15 (totalling 93 miles) which still use horse power, and six (totalling 21 miles) *which still have vehicles drawn by human power.*

* * *

The 618,055 railway-owned wagons in service on the British railways have capacities varying from 5 tons to 150 tons. Special wagons include 40-ton all steel hopper wagons, 50-ton brick wagons, 50-ton bogie bolster wagons for rails and girders, 65-ton bogie well trolley wagons, a 70-ton twin girder set, and a 120-ton side girder wagon, as well as a 150-ton well trolley wagon set.

* * *

WHAT NEXT?

The other day a scheme was talked of, of a bridge across the Mersey, to trip up the Manchester & Birkenhead Railway. We beg to mention a project very much akin to this just come to our knowledge, namely, a Joint Stock Company to construct a bridge to the moon. The capital is 100 millions in 36 million shares, to enable every man, woman and child to participate in this great terrestrial and lunar undertaking. The object is to see whether Herschell is right in asserting that the moon has volcanoes.—*From "Herapath's Railway Journal"* of October 19, 1844.

* * *

The oldest railwayman in age and length of continuous service, is believed to be Mr. John M. Horan, aged 98, boiler washing inspector, who was recently awarded a gold button by Vice-President Gillick upon the completion of 81 years with the Milwaukee Railroad, U.S.A. Born at Burlington, Vt., on January 23, 1838, Mr. Horan entered the employ of the Milwaukee & Mississippi RR., one of the first units of the present Milwaukee system on April 17, 1855. He is still erect, walks with a firm step, needs no glasses, and works every day. He is affectionately known to fellow-workers as "Soda Ash Johnny" as he is said to have originated the use of soda ash in the treatment of water in locomotive boilers.

* * *

Telegraphs on Railways.—It is said to be in contemplation to establish a system of telegraphic communication, both by day and night, on the great railroads now in formation, more particularly on the London and Birmingham, and Grand Junction lines . . . for the purpose of communicating commercial information and information connected with the management of the railway. . . . The plan of such a telegraph has been formed by Lieutenant Watson, of the Liverpool and Holyhead telegraph; and it is, therefore, not unlikely that in three or four years we shall not only be able to travel to London in ten or twelve hours, but to receive information from London in as many minutes.—*From "The Railway Magazine," November*, 1836.

The one-millionth brick has just been laid by workmen who since 1930 have been engaged on the re-lining of Summit tunnel, originally built by George Stephenson, which pierces the Pennines for a distance of 2,885 yd., 300 ft. below the surface, between Littleborough and Walsden stations on the L.M.S.R. main line between Lancashire and Yorkshire. Some 800 tons of sand and 400 tons of cement have also been used in repairing two of the five rings of bricks forming the lining of the tunnel, which had become perished owing to the ravages of time and of smoke fumes. Work has already been in progress for six years and it is expected that it will not be completed for several years to come.

A feature of the repairs is that these are being carried out without any interference, except for temporary speed restrictions, to the train service which is so intensive on this route (a main line between Manchester and Leeds) that on busy days as many as 500 or 600 trains pass through the tunnel. In order to protect the workmen a special system of warning bells is in use, these bells, which are fixed near the site at which work is going on, being operated by a lookout man from the mouth of the tunnel. Another lookout man is also stationed near the working party, and he repeats the warning to each man, who must acknowledge it. Gongs, automatically worked by the wheels of the trains, are also fixed at various points in the tunnel, and their clanging warns the enginemen to slow down as they approach the working site. To enable the roof of the tunnel to be repaired, temporary girders carrying stages are fixed between the side walls. And alterations necessary to this staging are carried out only on Sundays, when trains are fewer, while supplies for the working parties are also taken into the tunnel on Sundays.

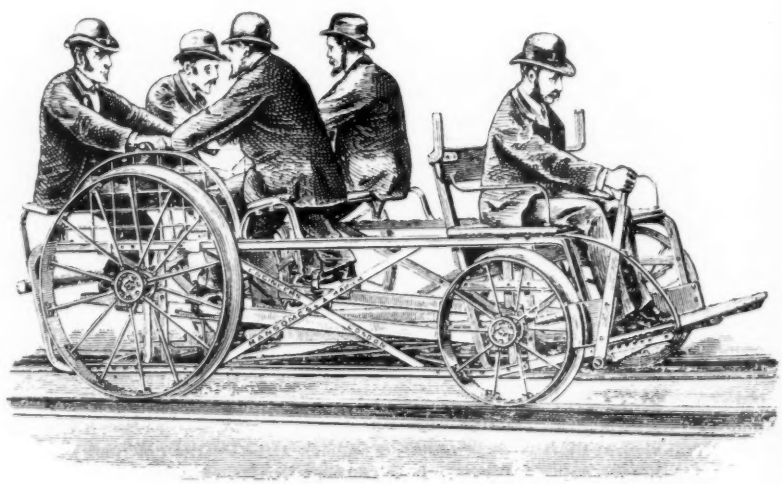
Built in 1839 for the Manchester & Leeds Railway (incorporated a hundred years ago this year), Summit tunnel was designed by George Stephenson; it cost £251,000 (or £87 a lineal yard), and 1,000 men worked for nearly 2½ years in its construction, for which 23 million bricks and 8,000 tons of cement were required. A contemporary writer described a trip through the tunnel in the following terms: "the rapidity of the flight, the screech of the warning signal from the engine, the overhanging column of mingled smoke and steam, the rush of air, together with the lurid glare and innumerable sparks thrown by the flambeaux which the train carries, and others borne by persons stationed in the tunnel, conspire, with the feeling that we are passing through the body of a huge mountain, to excite and awe our minds; for there we are out of peril, yet in the very midst of the stupendous works of nature, and the highest triumphs of human enterprise."

* * *

"I always enjoy a little nap in the train every evening," a reader tells us. But he must be careful with whom he plays.

* * *

WANTED, a YOUNG MAN, age 25-30, to WORK on MINIATURE RAILWAY in Kent. Must be a Sahib and locomotive enthusiast. Would live with family.—For full particulars write Box P.1157, The Times, E.C.4.—*From "The Times" small advertisement columns last week.*



Over 50 years ago Ransomes & Rapier Limited designed engineers' inspection trolleys for use by permanent way inspectors, and the above illustration shows one of those supplied in 1883. The method of operation by a crank axle actuated by reciprocating pedals has, of course, been largely replaced nowadays by the use of an internal-combustion engine

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

ARGENTINA

B.A. Provincial Railway ; Proposed Sale to the National Government

The Ministry of Public Works of the Province of Buenos Aires has sent a message to the Provincial legislature, embodying a proposal for the sale of the Provincial Railway to the National Government, the sum obtained in this way to be placed in the Civil Loan Fund, pending a decision as to the method of investing it. In the event of the National Government not accepting the offer, the Provincial Government is authorised to endeavour to come to a working arrangement with the other railways serving the same zone, with a view to eliminating injurious competition. Should the railway remain the property of the Provincial Government, the authorities are authorised to prepare a scheme of new developments for improving the working of the line, including increased facilities for colonisation, the creation of urban centres near those stations where local conditions are favourable, and the purchase of new rolling stock and equipment at an estimated cost of $12,000,000 paper to be defrayed by an issue of internal bonds bearing interest at 6 per cent. per annum and 1 per cent. amortisation.

In reviewing the financial position of the railway, the message states that the obligations incurred by the Provincial Government with respect to the line since its opening in 1911, amount to $99,854,890 paper, exclusive of interest due on Treasury notes, payment of taxes and miscellaneous items authorised by special laws, and for which no provision was made in the budget. The interest on the foregoing obligations is, approximately, $7,000,000 paper per annum.

Analysis of Operating Results

During the seven years 1928-32, 1934 and 1935 there was a total loss on working of $4,166,851 paper. The three years 1926, 1927 and 1933 produced a total profit on working of $857,522 paper. Thus, during the last 10 years, the accumulated total deficit amounts to $3,309,330 paper. Furthermore, the working expenses do not include the cost of new works and various subsidiary schemes, estimated at 8 per cent. of the expenditure budget, or, some $400,000 paper per annum.

Reasons for the Loss

Among the causes to which the loss on working is attributed are the proximity of the line to other railways; too-low freights, and the fact that colonisation within the railway zone, which was one of the objects for constructing the line, has been left to individual enterprise, the authorities not having taken official steps to encourage small farmers and others to purchase holdings in the adjoining districts.

Gain to the State Railways

It is pointed out that the purchase of the line by the National Government would be of great advantage to the State Railways operating within the Province of Buenos Aires. The main line of the Provincial Railway, if extended from the present terminus at Mira Pampa across the Pampa territory, would permit of a junction with the branch at present being constructed by the State Railways from the north to San Luís, linking up at that point with the line from Mendoza. The State Railway system located in the central zone of the Republic, would have in the trunk line of the Provincial Railway the means of access to the Federal Capital and the Port of Buenos Aires through Avellaneda terminal station. Finally, the incorporation in the State Railways of the Provincial branches from Azul and Olavarria would facilitate the extension of the national railways to the ocean ports of Mar del Plata, Quequen and Bahia Blanca, although this would mean serious competition with the Buenos Ayres Great Southern Railway, which serves these points.

The Penalty of Unfair Competition

It is instructive to note that among the reasons assigned above for the loss on working, are low freights and the proximity of other railways. In this connection, it may be recalled that reference has been made in THE RAILWAY GAZETTE from time to time, to the unfair policy followed by the Provincial Railway towards the private companies operating in the same zone, by building branches which have encroached on their territory and undercutting them in the matter of rates. The latter practice has frequently evoked courteous but strong protests from the companies affected, chiefly the B.A.G.S. & B.A.W. and Midland Railways, which have suffered severely from a policy which has now recoiled on the Provincial Government line. It is also of interest to note that the proposal to come to a working agreement with the other railways was put forward several years ago by a joint deputation representing the railways mentioned above, which in an interview with the Governor of the Province and his Minister of Public Works, suggested that efforts should be made to come to some agreement in working which, without interfering with the rights of the Provincial Railway, would safeguard the interests both of the private companies and the public, as recorded in THE RAILWAY GAZETTE of January 27, 1933.

Visit of Locomotive Engineers to Mendoza

The third quarterly meeting of the South American centre of the Institution of Locomotive Engineers was held in Mendoza, whither a party of members numbering about 120 travelled by special train on September 24, for the purpose of visiting the locomotive workshops and running sheds of the B.A. & Pacific Railway there, when a paper on "Railcars," by Mr. J. Campbell, M.I.Loco.E., of the B.A.P.R., was discussed. [This paper was reported upon at some length in our *Diesel Railway Traction Supplement* of October 30.—ED. *R.G.*]

Mr. R. E. Kimberley (Chief Mechanical Engineer of the B.A.P.R.) welcomed the visitors on behalf of the management ; and Mr. Ormond Steven (Chief of Operation, B.A.G.S. and B.A.W.R.), who presided, congratulated Mr. Campbell on his instructive paper, and also called for a vote of thanks to the management of the B.A.P.R. for the courtesies which they had extended to the members in connection with the trip. In addition to the Chairman, the following took part in the discussion :—

Major R. K. Hubbard (C.A.R.) ; Messrs. R. E. Kimberley (B.A.P.), A. Black (B.A.P.), E. C. Noble (late of the Entre Rios Railways), H. M. MacIntyre (B.A.G.S.), R. A. Carr (Dearborn Chemical Company), B. L. Beckwith (General Electric Company), W. C. Barker (B.A.P.), P. L. Falconer (C.A.R.) (paper read) ; W. H. Houghton (B.A.G.S. and B.A.W.), F. Davis (C.A.R.), W. L. Topham (B.A.G.S.), R. A. Thornton (Evans, Thornton & Co.), E. J. Beckwith (B.A.P.), E. Woodbridge (B.A.G.S. and B.A.W.) (paper read) ; S. M. Young (B.A.P.), N. L. Baillie (B.A.P.), F. Lockwood, J. E. De Marchi (B.A.P.) (paper read) ; R. W. Walker (Associated Equipment Company), J. W. C. Tyrrell (C.A.R.), E. S. Purdom (B.A.G.S.), F. A. Bottomley (E.R. Railways), and the author.

In addition to inspecting the railway workshops and running sheds, [see illustration on page 861—ED. *R.G.*] the visitors also made excursions to other places of interest, including a cement factory and the Villavicencio bottling factory, while the Union Club and the golf club were also included in the itinerary of a most enjoyable as well as highly instructive trip. The party returned to Buenos Aires on September 27.

INDIA

Sidelights on the Committee of Inquiry

In connection with the appointment of the Indian Railway Committee of Inquiry [recorded in our issues of October 23 and November 6—ED. *R.G.*] it is significant that though both the volume of traffic and the cost of living are now in the neighbourhood of pre-war figures, the railway wages bill has increased several fold since 1913. The recent decision of the Railway Board to reduce staff is strenuously opposed by the Indian Railwaymen's Federation, and local unions have been

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freely talking of a stay-in strike if the policy of retrenchment is made operative. An independent inquiry by experts dissociated from Indian railway administration will, doubtless, strengthen the hands of the authorities to inaugurate measures calculated to increase the net earnings of the railways. The absence of Indians on the committee of inquiry is a source of displeasure to the Indian commercial communities in Calcutta and Bombay, but there is much to be said in favour of the appointment of a small and businesslike committee of experts, entirely free from local influence, to effect a thoroughgoing review of railway administration. It is expected that the advice of the committee will be helpful to the Government of India in dealing with the problem of road competition, though the committee will naturally be charged to bear in mind provincial interests in submitting their proposals on this subject.

Troop Trains

The movement of troops in a vast country like India has long engaged the attention of the Military and Railway Departments, and important amenities are provided in the special trains in which British troops are now transported from one part of the country to another. These trains, which are composed of " military car " corridor stock, are each provided with a hospital compartment in charge of a doctor. Special canteen and kitchen cars are attached so that soldiers can obtain their food and other requirements without detraining. The kitchen car, which is fitted with cold storage arrangements, is in charge of an English cook.

UNITED STATES

Two Spectacular P. RR. Accidents

The last week in October witnessed two spectacular accidents on the Pennsylvania electrified main line between New York and Philadelphia. The first of these occurred on October 27 at Menlo Park, N.J., 25 miles southwest from New York. Two steam-drawn freight trains were moving in opposite directions on the two middle tracks of the four-track line. The westward train was made up of 125 empty cars and the eastward of 86 loaded cars. A low coupler on the ninth car of the westward train permitted the cars to separate and resulted in a derailment which fouled the adjacent eastward line just as the eastward train approached. It struck the wreckage, and as a result the locomotive and some twenty cars were tossed about, completely blocking all four lines, and the driver was killed. The accident occurred early in the afternoon.

Three days later, at about 9 in the evening, near Princeton junction, some 23 miles westward of the first accident, the Clevelander night Pullman sleeping car express from New York to Cleveland, was derailed while travelling at considerably over 60 m.p.h., again blocking all four lines and doing considerable damage, also to the overhead electric power equipment. One passenger was decapitated. The accident is believed to have been caused by a wheel failure.

Heavy Car Loadings Persist

Freight car loadings have remained above 800,000 now for the fourth successive week, two weeks after the seasonal decline was to have been expected. Passenger traffics likewise continue at high levels. The New Haven Railroad—prominent among the passenger-carrying lines—in September enjoyed an increase of no less than 25 per cent. in gross passenger revenues over those of a year ago. This increase, it will be remembered, comes despite (in fact, possibly, because of) a decrease in rates of 44 per cent. for coach travel, and 17 per cent. for Pullman service, which came into effect in June.

Preliminary reports of net railway operating income (net earnings, after taxes but before interest on bonds) for September show a total of £13,746,000, an increase of £2,533,000 over September, 1935. Gross operating revenues for the month totalled £69,628,000, an increase of 16 per cent. over the total for September, 1935, while operating expenses increased 13·7 per cent. to a total of £48,385,000.

SOUTH AFRICA

Rand Electric Supply

Negotiations are proceeding between the South African Railways and the Electricity Supply Department of the Pretoria City Council with a view to the latter body supplying the current for the Rand electrification in the district. It is estimated that 5,000,000 kWh. a year will be required by the two substations close to Pretoria, and this will necessitate an extension to the city plant.

Revenue

The revenue of the South African Railways & Harbours for the first half of the present fiscal year, April 1 to September 30, was £15,384,592, an increase of £1,260,698 over the corresponding period of last year.

ANGOLA AND BELGIAN CONGO

General Developments

The gross receipts of the Benguella Railway for the first nine months of the present year were 19,860,648 angolares (£180,000) and the net receipts 6,223,685 angolares (£56,700).

Special boat trains are now running between Lobito Bay and Katanga in connection with the arrivals and departures of the Cie. Maritime Belge and Union-Castle steamers, and it is proposed to extend the run of these trains down the Katanga Railway to the Rhodesian frontier.

An exhibition train displaying Belgian goods and services recently made a return trip between Elizabethville and Port Francqui; stopping at all settlements en route.

Surveys are being made for a new railway, 48 miles long, to connect the Albertville—Kabalo and Kongolo—Kindu lines of the Upper Congo & Great Lakes Railway, and thus give direct rail access from Lake Tanganyika to the middle Congo and Lomami districts, and aid mining development at Maniéma.

IRELAND

Tourist Traffic in the Free State

At the twelfth annual meeting of the Irish Tourist Association it was announced that the tourist traffic to the Irish Free State for the past year had considerably improved, and that the increase in holiday business for the current compared with the preceding year was estimated at £50,000. It was claimed that the tourist traffic was next in importance to agriculture, including livestock. The Acting Minister for Industry and Commerce stated that the Government continued to be in wholehearted sympathy with the tourist movement.

Roads Improvement

There has been a heavy expenditure on road making and maintenance, and it was hoped that the tourist might be induced to leave the beaten track occasionally to visit many of the beauty spots now comparatively unexplored. Another help to the tourist industry is the expansion of trade in Great Britain. There are, of course, a large number of Irish domiciled in England who must benefit by the general prosperity in that country, and consequently are able to spend a holiday in visiting their homeland.

Railway Improvements and Propaganda

Sir Walter Nugent, Chairman of the Great Southern Railways, said that every service in connection with touring, even to the much abused railways, had improved immensely. The Great Southern Railways, in co-operation with certain British companies, had established a New York office where a staff representative of the Great Southern Railways advised intending visitors to Ireland. Representatives were being sent through the principal cities and towns of the United States to explain to intending visitors the facilities Ireland afforded.

Admittedly there was congestion at their ports during the tourist season. The Great Southern Railways, aware of that fact, had built two special trains to relieve the congestion at Dun Laoghaire, but the Chairman hoped that in the near future the Government would also signify its recognition

of that congestion by building extensions at the port to enable trains to take off passengers more rapidly. The railway, for instance, was anxious to run a train for the West of Ireland, to take tourists direct to Connemara.

Other speakers referred to the continued improvement in the hotels, their facilities, amenities and tariffs. For propaganda purposes it is proposed to circulate films free, for exhibition in liners and schools.

In the summer, day excursions, generally from North Wales, were, in the past, arranged on Thursdays, to Dublin, arriving in the early forenoon. This year the excursions have also been arranged on Wednesdays, and have proved a great success. The railway companies provide buses to meet these boat trains at Westland Row, Dublin, and to give an afternoon tour of the countryside, north and south, returning in time for the return boat trains.

Train and Steamer Traffic

The reference to congestion, in Sir Walter Nugent's speech, was presumably to the passengers arriving at Dun Laoghaire on Saturday mornings. As many as three boats arrive on busy Saturdays in the holiday season, and the second and third boats sometimes clash with the departure time of the outgoing steamer. The Great Southern Railways have found it necessary to run additional trains on many Saturdays to different parts of the country, for passengers on the later boats when they do not arrive in time for ordinary connections. The company is considering the possibilities of starting the morning mail train to the west from Dun Laoghaire Pier when Broadstone station is closed. At present trains are run from Dun Laoghaire pier to Broadstone to connect with the morning and evening mail trains for Galway, Mayo and Sligo.

Accelerated services with luxurious rolling stock for long distance trains have been provided, and it is expected that additional carriages of the most modern type will be available to add to the comfort of the tourist.

Fenit Pier

At Fenit, the Port for Tralee (a town of about 10,000 inhabitants), which is the distributing centre of a large district in Kerry, the pier accommodates vessels of upwards of 5,000 tons, but has no roadway access; cargoes have, therefore, to be conveyed by rail, except such portion as may be loaded into lighters and brought up the river to Tralee. It is now proposed to build a viaduct at the port and to make a roadway for lorries for the loading and unloading of merchandise from the ship side; also to provide a lairage for pigs and cattle. A free grant of £20,000 was offered by the Government on condition that the balance required would be raised on loan, and the Kerry County Council has decided to guarantee this amount. The result of this decision means that lorries will be able to bring the traffic direct to the ship side and live stock will also be taken direct, introducing a further sphere of road competition against the direct rail traffic.

ITALY

State Railway Improvements

During the period from October, 1935, to October, 1936, about 650 km. of line have been strengthened with the view to increasing the speed of trains. On the Rome--Florence line the former signalling and interlocking equipment of foreign design has been replaced by an Italian designed and built plant, which has given better and more economical results. The Loano—Albenga section of the Genoa—Ventimiglia main line along the Italian Riviera has been doubled, a work that has necessitated the construction of a new tunnel 316 m. in length, and a viaduct of 52 arches at Ceriale. The commercial port of Spezia has been connected with the railway terminus, and new stations have been built at Viareggio and Trento, and another is in hand at Redipuglia.

BRAZIL

Railways Serving North-Eastern States

The commission appointed by the Engineering Club of Recife (Pernambuco) to draw up a systematic plan for extending railways in the North-Eastern States of Brazil has now concluded its report, and has suggested that a conference be held in the near future to discuss its proposals.

Rêde Mineira de Viação in 1935

In his annual report for 1935, Snr. Benedicto Valladares, Governor of the State of Minas Geraes, alluded to the State's increased agricultural production, citing two commodities in particular—cotton and oleaginous beans—but said that deficient rail transport, in consequence of shortage of rolling-stock and arrears of maintenance on the Rêde Mineira de Viação, had seriously handicapped the development of industry in general. This system, which, with the completion of the Patrocinio-Ouvidor extension, would have over 4,000 km. of line, served no less than 40 per cent. of the townships situated in Minas Geraes, in addition to various places in the States of Rio, São Paulo, and Goyaz; and in order to fulfil its extensive obligations, it urgently required new rails for 500 km. of track and a further 600 goods vehicles and 40 passenger coaches. On the southern section in particular (the original E. F. Sul Mineira) serving three or four hydropathic centres, there was a shortage of Pullman-type coaches, a fact which had undoubtedly contributed to a falling-off of passengers in this area.

Strenuous efforts had been made in 1935 to reduce expenses and put the system on a paying basis, but the latter could only be accomplished by the provision of adequate equipment, lack of which prevented the Rêde Mineira de Viação from accepting, at a modest estimate, two-thirds of the traffic offered. Financial results for 1935 were as follow :—

	Contos
Gross receipts	37,360
Expenditure	47,162
Deficit	9,802
Operating ratio, per cent.	126

MANCHUKUO

New S.M.R. Dry Dock for Dairen

A new dry dock is to be built at Dairen by the South Manchuria Railway. It will be capable of docking vessels of 10,000 tons, and the cost of construction will be approximately Y. 5,000,000. Actually the dock will be situated at Kanseishi, a suburb of Dairen at the far side of the bay from the city.

Hulutao Harbour

The S.M.R. has completed a new harbour at Hulutao, at the southern extremity of Jehol Province, capable of accommodating vessels up to 2,000 tons. The Hulutao Harbour Construction Committee of the railway is, however, proceeding with a five-year plan to increase the capacity very considerably and enable up to 4,000,000 tons of goods to be handled annually. Work will begin as soon as the coming winter's thaw makes it possible.

Light Railway Purchased by Government

The privately-owned Tsi-ang light railway which was opened in 1909 to connect Tsitsihar with Angangchi, on the Harbin—Manchouli section of the former C.E.R., has been bought by the Government and will in future be run as part of the State Railways system.

CHINA

Peiping-Liaoning Railway

Railcars are to be placed in traffic on the Peiping-Liaoning (Pekin-Mukden) Railway to work on the Peitaiho and Tunghsien branches and on the Tientsin-Tangku section. Six vehicles will be used and special car sheds are being erected for them at Tangku, Tientsin East, Peitaiho Beach and Chien Men.

Miscellaneous Items

Work upon the extension of the Canton-Hankow Railway to Whampoa harbour has begun. It is expected to cost about $2,500,000.

The roadbed of the Nanchang—Pinghsiang extension of the Chekiang—Kiangsi Railway has now been completed. Rails and sleepers have been supplied and laying of the track will begin in November. It is anticipated that the line will be ready for opening in the autumn of 1937.

XUM

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table for July, 1936, as compared with July, 1935, compiled from the Ministry of Transport Statement No. 200

Description	Great Britain*	G.W.R.	L.N.E.R.	L.M.S.R.	S.R.
PASSENGER TRAIN TRAFFIC—					
Number of pass. journeys (ex. season ticket holders)	117,818,759	8,976,718	19,191,231	30,053,160	20,255,937
Increase (+) or decrease (−)	+ 1,844,800	− 397,071	− 276,103	+ 182,576	+ 131,408
Passenger receipts (excluding season ticket holders)	£7,272,197	£1,015,909	£1,550,353	£2,649,220	£1,429,938
Increase (+) or decrease (−)	+ £664,221	+ £99,486	+ £144,305	+ £293,120	+ £92,752
Season ticket receipts	£736,699	£44,720	£134,452	£199,314	£241,518
Increase (+) or decrease (−)	− £44,266	− £4,370	− £8,330	− £15,533	− £9,964
Parcels and misc. traffic receipts (excluding parcels post)	£1,171,198	£202,146	£364,591	£429,381	£150,005
Increase (+) or decrease (−)	+ £32,228	+ £1,871	+ £20,981	+ £6,537	+ £1,814
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	18,965,947	4,463,511	8,852,943	8,767,523	1,210,352
Increase (+) or decrease (−)	+ 1,209,292	+ 11,290	+ 790,513	+ 770,819	+ 81,387
Net ton-miles (excluding free-hauled)	1,119,871,709	207,271,712	375,501,413	457,183,360	49,055,951
Increase (+) or decrease (−)	+ 98,422,880	+ 11,174,697	+ 37,569,933	+ 47,133,799	+ 61,125
Average length of haul (miles) (excluding free-hauled)	59·05	46·44	42·42	52·15	40·53
Increase (+) or decrease (−)	+ 1·53	+ 2·40	+ 0·51	+ 0·87	− 2·87
Freight traffic receipts	£6,293,284	£1,078,000	£2,109,000	£2,532,000	£366,350
Increase (+) or decrease (−)	+ £526,652	+ £72,500	+ £199,000	+ £208,000	+ £26,698
Receipts per ton-mile	1·349d.	1·25d.	1·35d.	1·33d.	1·79d.
Increase (+) or decrease (−)	− 0·006d.	+ 0·02d.	− 0·01d.	− 0·03d.	+ 0·13d.
Freight train loads : Average train-load (tons)	121·87	128·23	126·10	120·47	100·71
Increase (+) or decrease (−)	+ 5·23	+ 2·39	+ 6·11	+ 6·54	+ 0·75
Net ton-miles—					
Per train engine-hour	976·53	1,029·33	1,010·48	962·24	801·97
Increase (+) or decrease (−)	+ 9·41	− 17·52	+ 13·31	+ 15·70	+ 6·63
Per shunting-hour	847·80	771·22	919·99	896·61	543·13
Per total engine-hour	453·81	440·89	481·56	464·13	323·82
Net ton-miles per route-mile per working day	2,571	2,538	2,736	3,025	1,112
Increase (+) or decrease (−)	+ 226	+ 138	+ 266	+ 307	+ 23
Wagon-miles. Total	334,391,523	59,885,583	116,498,328	138,821,920	17,043,876
Increase (+) or decrease (−)	+ 21,580,149	+ 3,173,982	+ 7,406,171	+ 10,034,631	+ 759,417
Percentage of loaded to total	66·72	68·17	64·04	68·53	65·92
Wagons per train. Total	34·20	34·35	34·79	34·05	32·44
Increase (+) or decrease (−)	+ 0·70	+ 0·67	+ 0·50	+ 0·79	+ 1·34
Loaded	22·82	23·41	22·28	23·33	21·38
Empty	11·38	10·94	12·51	10·72	11·06
Train-miles. Coaching—Per train-hour	15·29	14·38	14·59	14·70	17·67
Per engine-hour	12·01	11·26	11·16	11·05	14·28
Train-miles. Freight—Per train-hour	9·42	9·75	9·40	9·32	9·70
Per engine-hour	3·72	3·45	3·87	3·85	3·16
Engine miles. Total	49,846,523	7,783,561	13,753,796	18,580,647	6,756,930
Increase (+) or decrease (−)	+ 1,442,173	+ 233,717	+ 459,182	+ 607,239	+ 92,570
Mileage run by engines. Total train-miles—					
Coaching	27,048,524	3,726,864	6,430,547	9,088,581	5,071,189
Freight	9,776,655	1,743,427	3,348,775	4,076,782	525,435
Engine-hours in traffic. Total	5,065,846	859,077	1,511,267	1,953,483	539,788
Increase (+) or decrease (−)	+ 193,836	+ 27,021	+ 65,095	+ 91,494	+ 6,096
Shunting miles per 100 train-miles—					
Coaching	7·18	6·71	6·45	7·72	7·92
Freight	71·62	83·11	67·29	66·14	97·44

Passenger Traffic Statistics: Number of journeys, receipts, and receipts per journey (excluding season ticket holders)—July, 1936

Subject	Great Britain	G.W.R.	L.N.E.R.	L.M.S.R.	S.R.	Cheshire Lines	Liverpool Overhead	L.P.T.B.†	Mersey
Full fares—									
Pass. journeys	32,646,783	764,256	1,261,058	1,709,227	3,049,937	17,225	164,699	24,760,645	81,015
Gross receipts	£1,140,788	£111,086	£186,211	£181,499	£297,975	£3,171	£1,706	£340,121	£1,456
Receipts per pass.	8·39d.	34·88d.	35·44d.	25·49d.	23·45d.	44·18d.	2·49d.	3·30d.	4·31d.
Reduced fares—									
Excursion and week-end—									
Pass. journeys	51,546,205	5,513,224	12,631,704	19,582,393	9,889,947	482,506	154,812	1,432,770	666,001
Gross receipts	£4,962,982	£744,017	£1,131,685	£2,103,204	£839,171	£44,835	£1,634	£33,028	£10,684
Receipts per pass. journey	23·11d.	32·39d.	21·50d.	25·78d.	20·36d.	22·30d.	2·53d.	5·53d.	3·85d.
Workmen—									
Pass. journeys	26,885,214	1,805,709	3,592,748	6,936,096	5,783,308	241,326	195,132	7,208,438	197,094
Gross receipts	£397,261	£27,288	£59,332	£113,894	£97,136	£4,363	£1,601	£80,702	£1,789
Receipts per pass. journey	3·55d.	3·63d.	3·96d.	3·94d.	4·03d.	4·34d.	1·97d.	2·69d.	2·18d.
Other—									
Pass. journeys	6,574,228	856,181	1,662,146	1,754,910	1,519,193	95,833	43,218	509,396	16,891
Gross receipts	£585,961	£91,040	£128,381	£167,792	£181,891	£4,910	£285	£5,334	£258
Receipts per pass. journey	21·39d.	25·52d.	18·54d.	22·95d.	28·73d.	12·30d.	1·58d.	2·51d.	3·67d.
Total—									
Pass. journeys	117,818,759	8,976,718	19,191,231	30,053,160	20,255,937	837,552	557,861	33,911,249	961,007
Gross receipts	£7,272,197	£1,015,909	£1,550,353	£2,649,220	£1,429,938	£57,936	£5,226	£459,185	£14,190
Receipts per pass.	14·81d.	27·16d.	19·39d.	21·16d.	16·94d.	16·60d.	2·25d.	3·25d.	3·54d.

* All standard gauge railways

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Road Services Required in India

THAT there is still much scope for the development of road transport services operated in connection with overseas railways is frequently shown in the reports of the various administrations. Some interesting observations on the possibilities in India were made by Sir Ernest A. S. Bell, Chairman and Managing Director, South Indian Railway, at the company's recent annual general meeting. In the first place he was of the opinion that the railways should lose no time in organising a collection and delivery service for goods traffic in all the larger towns, and also for approved customers. There was also, he considered, plenty of scope for bus services in developing areas still without modern means of transportation. In such areas bus services could reap a rich harvest. The South Indian system, which at present has no road interests, consists of 664 miles of broad gauge and 1,863 miles of narrow gauge lines. Any development on the lines suggested by Sir Ernest Bell would, therefore, open up considerable new markets for British manufacturers.

Ribble Enterprise

ON pages 851-853 of this section we illustrate and describe the new Blackpool omnibus station. Although this is a joint enterprise of the various railway-associated road passenger service operators working in and out of Blackpool, the Ribble Motor Services Limited, having subscribed 50 per cent. of the capital in Blackpool Omnibus Stations Limited, can claim the lion's share of the credit. Moreover, it was Mr. C. D. Quinn, the Ribble company's architect, who was responsible for the design of the station. At the foot of this page we show a new Ribble garage, also of Mr. Quinn's design, which has recently been opened at Bootle with accommodation for 120 vehicles. This has many novel engineering features of an experimental nature. For instance, petrol, diesel oil, and water are available from a single refueling standard, and the pressure used in filling the storage tanks from the road lighters is conserved for operating the pumps. A new Ribble garage of similar design but with accommodation for only 84 buses is also being built at Blackpool. This should be ready for service in the spring. Next year will also see the opening of the company's new head offices at Preston. These are now in the course of construction on a site opposite the present offices in Frenchwood Avenue. Incidentally, this enterprising road associate of the L.M.S.R., works a fleet of some 880 buses and coaches, mostly of Leyland types, and covers with its buses an area extending from Liverpool and Manchester to the Scottish Border.

British Railways: The Largest Road Hauliers

IN a memorandum submitted last week by the four group railways to the committee set up by the Ministers of Transport and Labour to consider labour questions in the road transport industry (goods), the claim is made that the road transport departments of the railway companies, together with their associated companies, are the largest road transport undertakings in the country. This is substantiated by some instructive statistics. The companies own and operate for themselves approximately 9,000 motor vehicles (including tractors), 5,000 trailers, and 26,000 horse-drawn vehicles. The "A" licences held number 12,982, the "C" licences 74. More interesting than these, however, are the figures, not previously revealed, which give the total number of road vehicles owned by companies financially controlled by the railways. These include, of course, such concerns as Pickfords Limited and Carter Paterson & Co. Ltd., which themselves have subsidiaries. The railways, the memorandum reveals, control through such operators no fewer than 2,641 motor vehicles, 601 trailers, and 1,717 horse-drawn vehicles. The policy of converting from horse to mechanical traction is, needless to say, common to both the railway road transport departments and their associated concerns. On another page in this section a correspondent comments more fully upon the railway companies' memorandum.

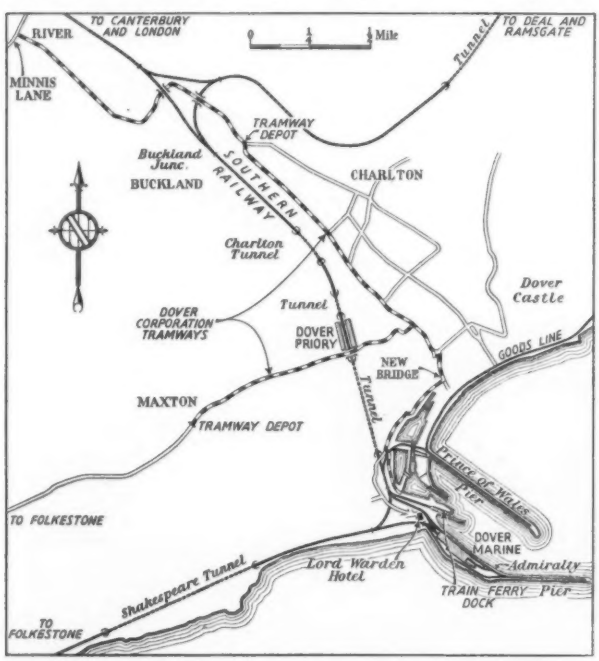
The new Bootle (near Liverpool) garage of the Ribble Motor Services Limited referred to in the note above

The Small Bus

THE small bus is playing an increasingly important part in the linking up of different transport services. As an example of its use in urban areas there are the Interstation services recently introduced jointly by the London Passenger Transport Board and the four main-line railways; the vehicles were fully described in our Road Transport Section of October 23. Elsewhere the railways have co-operated in the provision of similar road transport facilities to link train services with airports on Railway Air Services' routes. There is still, however, considerable scope for the development of these facilities. For instance, in Scotland, where air transport is growing rapidly in popularity and where there are a large number of steamer services, many opportunities present themselves for the introduction of buses, seating say 20-25 persons, to link rail, air, and water transport. The new London Interstation vehicles are of interest when considering the inauguration of such facilities as they raise the question of specialised design. The provision of a large and easily accessible luggage compartment, for instance, is particularly important where the buses are intended to provide a link in a chain of transport. The elevation of certain seats above the luggage lockers, however, may give rise to ventilation problems. The subject of such specialised design is, therefore, worthy of the attention of both operators and manufacturers.

Dover Transport

AN interesting co-ordination arrangement between a municipality and a railway-associated bus company is that at Dover, which is to come into force on December 31. On that date the Dover Corporation tram system will be worked for the last time, and from the first day of next year the local services will be provided by the buses of the East Kent Road Car Co. Ltd., a Southern Railway associate. The agreement with the East Kent Road Car Co. Ltd., provides that the company shall work services of stage carriages over all the present tramway routes (subject to certain slight variations) not less frequent in any period of the year than the frequency of the existing tramway services over every particular route. Bus route No. 1 will be between Maxton and the Rifle Monument, New Bridge; route No. 2 between the junction of Lewisham Road and Minnis Lane, River, and the Lord Warden hotel; and route No. 3 between Buckland and the Lord Warden hotel. In every case this means a very slight extension of the existing tramway system. The agreement also provides for the operation by the company of new services over additional routes within the borough, but these have not yet been finally decided upon. It will be recalled that arrangements for tramway supersession in the Isle of Thanet were outlined in our Road Transport Section of September 25. The latter change-over will take place probably on March 24 next and will result in the abandonment of the last surviving tramway in East Kent; there also the East Kent Road Car Co. Ltd. is to provide the local transport.



Sketch map of Dover showing tram routes

The Trunk Roads Bill

LAST night (Thursday) Mr. Hore Belisha, Minister of Transport, moved the second reading of the Trunk Roads Bill which makes the Minister the highway authority for some 4,500 miles of major roads, extending from Penzance in the south to Thurso in the north. The principle of the Bill is, of course, its main interest, but the Bill is also of importance as its successful passage through Parliament will have the effect of making the Ministry of Transport for the first time an executive department. Instead of, as at present, distributing sums from the Road Fund for approved schemes submitted by local authorities, the Minister will, under the terms of the Bill, supervise maintenance and initiate his own schemes of improvements. The Minister may, however, enter into agreement with local authorities whereby they will, as his agents, carry out the actual work. Thus, use will be made of existing organisations. The roads scheduled to be taken over by the Ministry constitute approximately 17 per cent. of the mileage of Class I roads in the country, and, in accordance with the title of the Bill, they will be known in future as trunk roads. Where in parts these roads lie within the County of London, a county borough in England or Wales, or a large burgh in Scotland, responsibility for such portions will remain vested in the local authority concerned. The annual cost of maintenance and minor improvement which now falls on local highway authorities in respect of the selected roads, after deducting grants from the Road Fund, is £666,000. The date of transfer for roads in England and Wales is April 1, and for roads in Scotland May 16.

Crosville Development

ONE of the largest railway-associated bus companies in Great Britain is Crosville Motor Services Limited, which has headquarters at Chester and serves practically all North Wales, as well as Cheshire, Shropshire, and adjacent parts of England. Some recently-issued figures show that the company operates 950 vehicles which cover 31,000,000 miles per annum and carry some 81,000,000 passengers. Annual fuel consumption is 3,750,000 gallons of petrol and diesel oil, and 80,000 gallons of lubricating oil. The staff, totalling 3,500, is provided with various welfare schemes, including clubs at all the company's large centres. At present 104 new vehicles are on order, while garage and other building developments are in progress at Flint, Crewe, Caernarvon, Wrexham, Rhyl, Llandudno, and Liverpool.

An Automatic and Infinitely Variable Gear

The Hobbs gear adaptable to road and rail vehicles

MECHANICALLY-CONTROLLED road vehicles of all kinds depend very largely for their efficient performance upon the handling of the gear-changing mechanism and the proper design and functioning of the transmission system as a whole. Those with long experience know that however well proportioned the ratios of the ordinary type of gearbox may be, the arbitrary fixed gear ratio system must always operate to some disadvantage owing to the constantly changing nature of the road and of the conditions under which the vehicle is working. In principle, although as yet by no means in general practice, the advantage of being able to select automatically a gear ratio to meet the precise circumstances of the moment, giving many variations between the fixed points set in the customary form of box, spells a very decided advantage, for in innumerable cases in the course of a day's run it is realised that a higher road speed could be maintained together with a corresponding drop in the speed of the engine itself, and a saving in petrol and wear and tear obtained, if only it were possible to change up or down to points intermediate between the set ratios provided.

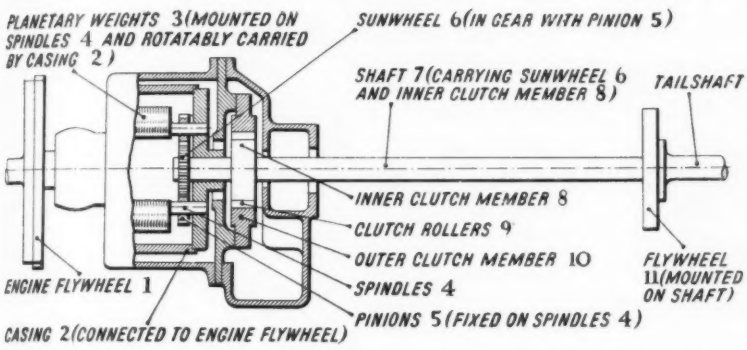

PLANETARY WEIGHTS 3 (MOUNTED ON SPINDLES 4 AND ROTATABLY CARRIED BY CASING 2)
SUNWHEEL 6 (IN GEAR WITH PINION 5)
SHAFT 7 (CARRYING SUNWHEEL 6 AND INNER CLUTCH MEMBER 8)
TAILSHAFT
INNER CLUTCH MEMBER 8
CLUTCH ROLLERS 9
OUTER CLUTCH MEMBER 10
SPINDLES 4
PINIONS 5 (FIXED ON SPINDLES 4)
FLYWHEEL 11 (MOUNTED ON SHAFT)
ENGINE FLYWHEEL 1
CASING 2 (CONNECTED TO ENGINE FLYWHEEL)

Fig. 1—Assembly of the gear, showing arrangement of planetary gearing and reversible roller clutch

In order to secure this, what is known as the infinitely variable principle in one form or another must be accepted as the governing rule, and efforts have been made from time to time, to provide mechanism that can be relied upon to give satisfactory performance, constant reliability, and safety, as well as the advantages referred to above. The latest development in this direction is the transmission system known as the Hobbs automatic and infinitely variable gear, with which extensive work and tests have been going on for some considerable time past. For this mechanism is claimed utmost simplicity of control, efficient infinitely variable gear ratios, and quietness in running. Nothing in the way of a clutch for disconnecting the engine from the gear, a clutch pedal, gear change lever, or even a selector mechanism is utilised in the system, the only controls required during driving being the usual accelerator and brake pedals. Reverse is obtained by merely pressing a small knob on the dash or steering column, and in a vehicle provided with the Hobbs gear the only operation required to start the car and reach top gear or any lower ratio is that of depressing the accelerator pedal in varying degree.

It is further claimed that acceleration from rest or from any speed is in general found to be superior to that of the orthodox forms of gearbox, and when starting or stopping on a gradient it is not necessary to apply the brakes as the gear prevents the car from running backwards even with the engine switched off. It is, moreover, impossible to stall the engine inadvertently. Top gear can be obtained merely by raising the accelerator pedal momentarily and can be maintained in that ratio and at low speed. In top gear the drive is positive from the engine crankshaft to the differential gear, and whilst weight is low the simplicity of design and the small number of wearing parts at the same time enable the manufacturing costs to be kept down. This mechanism may be regarded as a true torque converter with its infinite varying gear ratios and high efficiency. It also enables the engine to work at efficient speeds, avoiding racing or labouring, with a beneficial effect on wear.

Details of the Mechanism

The illustrations reproduced give a clear idea of the layout arrangement of the mechanism, which has three main elements set out as shown diagrammatically in Fig. 1, namely planetary gearing, reversible roller clutch or detent mechanism, and a resilient device. The planetary gearing comprises a sunwheel 6 and a number of planet pinions 5, to which are attached eccentrically placed weights 3. The outer member 10, the inner member 8, and the rollers 9, form the roller clutch. The resilient device is the shaft 7. The casing or frame forming the planet carrier is attached to the crankshaft of the engine, and usually through a resilient device to prevent any vibrational "beat" effect. The stationary member of the roller clutch 10 is attached to the gear housing, and the torsion shaft 7 to the part to be driven. In most cases a flywheel 11 is attached to the rear end of the torsion shaft.

Controlling means are provided to reverse the roller clutch for backwards running, and to regulate automatically the pressure on the rollers. The roller cage is provided with an independent spring for each roller, and the rollers are forced into the engaging position with the springs by movement of the cage. Rotation of the weighted planet pinions about the sunwheel produces, by reason of centrifugal force, a varying torque upon the

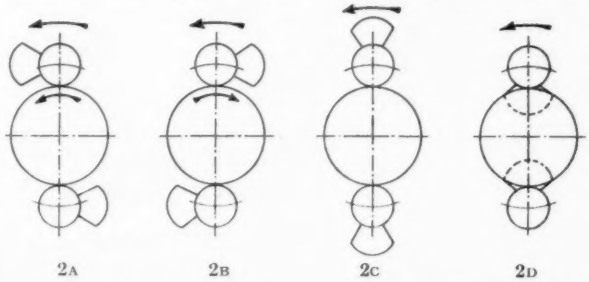


Fig. 2—Effect of planetary weights on sunwheel

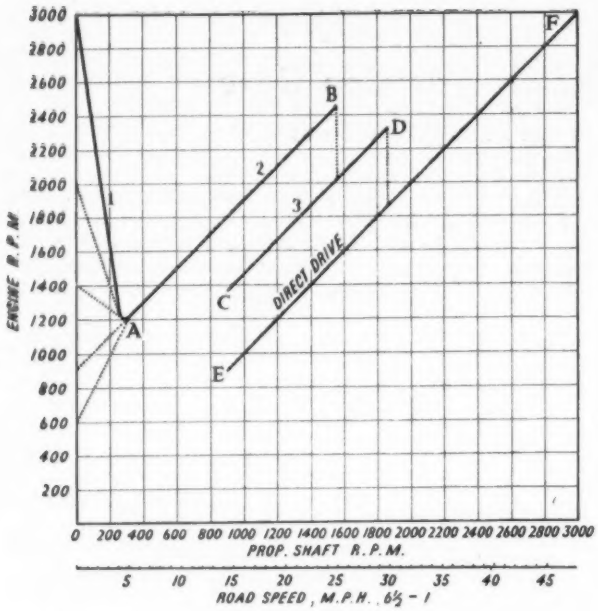


Fig. 3—Relation between engine and propeller shaft revolutions, with corresponding road speeds

sunwheel. As the eccentrically placed weights move towards the axis of the gear a positive torque is transmitted to the sunwheel (Fig. 2A), and there is a tendency to drive the sunwheel in the same direction as the planet carrier is rotating; as they move outwards a negative torque is produced, and the tendency is for the sunwheel to rotate in the opposite direction (Fig. 2B). When the weights are in their outermost and innermost positions they can exert no torque upon the sunwheel, by virtue of centrifugal force (Figs. 2C and 2D). The positive rotation is transmitted to the torsion shaft (7, Fig. 1); rotation in the negative direction is prevented by the roller clutch when set for forward running, and *vice versa* when set for reverse running. The torque exerted by the weights varies with the speed of rotation of the planet carrier, that is to say, the speed of the engine to which the gear is coupled. The torque varies as the square of the speed. When a sufficient speed is reached the torque exerted by the weights equals the torque developed by the engine and at any speed above this direct drive can be obtained, when the planets and sunwheel rotate as one, the planetary weights ceasing to rotate upon their own axes.

The torsion shaft plays an essential part in the functioning of the gear. It will respond to the impulses from the weights only at certain frequencies, and the most important consideration in the design is the natural frequency of vibration of the shaft and the parts of the gear attached at the gear end. There is a constant impulse frequency effect except at comparatively low speeds of the propeller or driven shaft. This enables gear ratios at any speed to be predicted, and suitable ratios provided for any particular application of the gear. It also provides an unexpected and useful feature in that by merely throttling the engine momentarily a different frequency can be selected, giving a different set of gear ratios. For instance in Fig. 3 engine speed is plotted against road speed, from which gear ratios can be obtained. At any point between A and B, engine speed and gear ratios can be reduced by momentarily partially closing throttle, to the line *C.D.*; or by fully closing the throttle momentarily top gear can be obtained (line *E.F.*). A very useful measure of control is therefore provided, which is particularly advantageous in the case of a motor vehicle; engine speed as shown below the point *A* occurs under full throttle conditions only.

Different sets of ratios may be required for various applications of the gear, and these are obtained by providing a suitable natural frequency of the torsion shaft system. The maximum starting torque obtainable depends on the design of the planetary weights. If the weights are designed to transmit engine torque at say 1,000 r.p.m. and, at starting, the engine is speeded up to 3,000 r.p.m., provided there is sufficient resistance to hold the propeller shaft stationary, nine times engine torque will be produced thereon. Thus if maximum engine speed is known, the maximum torque which will be produced under any condition can be immediately ascertained.

This brief summary does not permit a full discussion regarding design, but suitable performance for almost any applications of the gear can be obtained, where ratio or speed of the machine to be driven can be dependent on resistance or load on the machine, and/or speed of the engine. The mechanical efficiency of the gear is high, and wear on the gear teeth is definitely less, even with higher loading, than in the case of an ordinary gearbox;

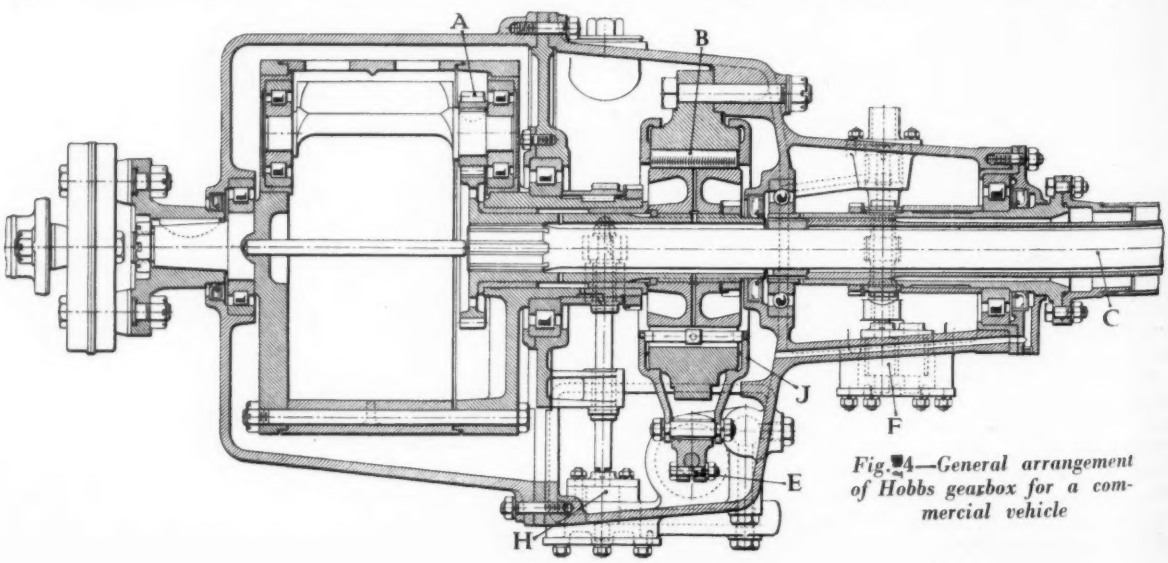
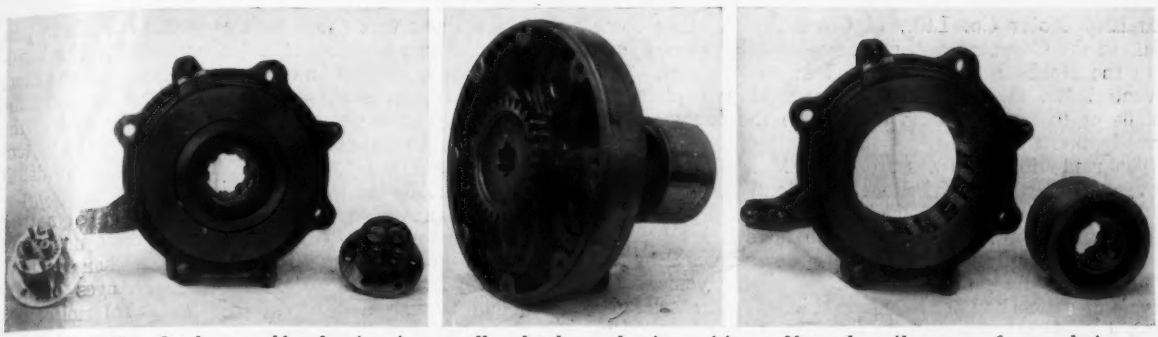
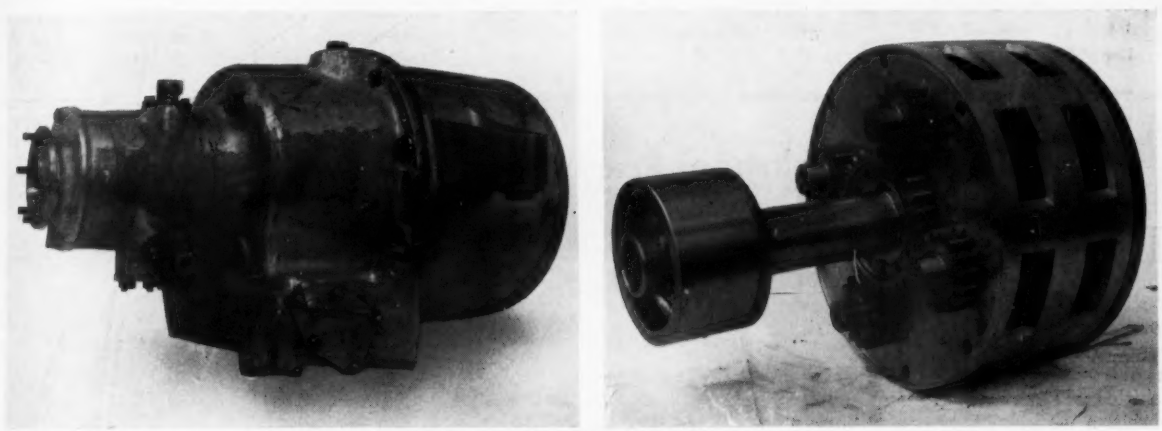


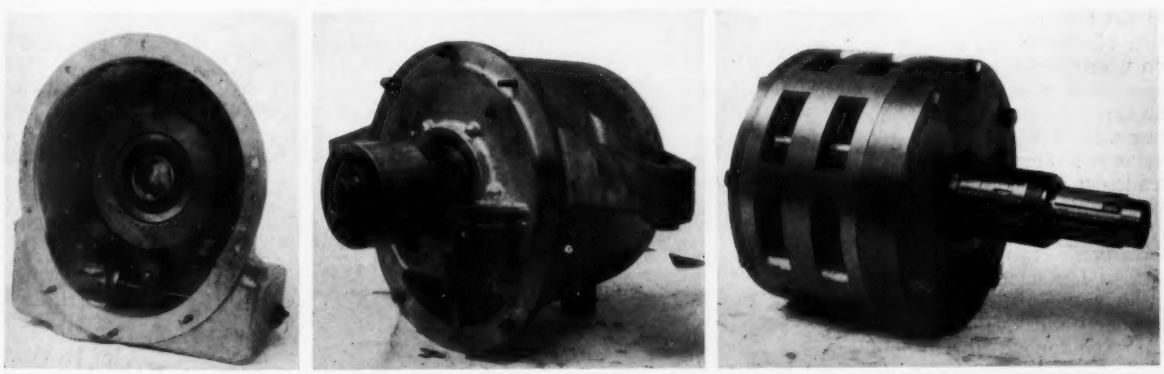
Fig. 4—General arrangement of Hobbs gearbox for a commercial vehicle



Left: Roller clutch assembly showing inner roller clutch member in position. Note also oil pumps for regulating pressure on rollers. Centre: Rear plate of planetary weight carrier showing sun wheel and bearings for planetary weights. Right: Roller clutch assembly with inner race removed showing rollers in position



Left: Complete assembly of front and rear casings. Right: Planetary weight carrier assembly showing sun wheel, pinions, and inner roller clutch race in position



Left: Rear casing showing roller clutch in position. Note roller cage control operated by difference in pressure of oil pumps. Centre: Front casing assembly enclosing planetary weight assembly; also showing arms on case for rubber mounting on frame and gear drive for oil pump. Right: Complete assembly of planetary weight carrier

no difficulty has been experienced in producing a roller clutch mechanism to function correctly without undue wear. The absence of wear on these parts is no doubt due to the presence of the torsion shaft, which yields from any sudden application of load and produces regular and smooth loading on all parts of the transmisson. The gear must be designed so that the torsion shaft itself is not overstressed and this offers no difficulty except that of providing sufficient length either in the form of one plain round shaft or a shaft and tube, or tubes arranged one within the other.

Fig. 4 shows the general arrangement of a commercial vehicle unit: *A*, planet pinions; *B*, clutch; *C*, shaft. The oil pump *H* is driven by the engine shaft, and the oil pump *F* by the propeller shaft. If the pump *H* rotates at a higher speed than the pump *F* an oil pressure is delivered to a piston which is connected by the yoke *E* to the roller cage *J*. The pressure acting on the roller cage and rollers through the piston automatically adjusts itself to suit conditions and is entirely removed for the top gear running so as to eliminate needless friction. The oil pressure is also used to move the cage, for forward or reverse running, by means of a piston valve.

Some Observed Tests

In view of the maker's somewhat ambitious claims for the gear, and in order to form our own opinion on the matter, we recently accepted an invitation from the

Maudslay Motor Co. Ltd., of Coventry, to make some trials in the Coventry district; a single deck bus equipped with the Hobbs gear being placed at our disposal. The inventor, Mr. H. F. Hobbs, was present to explain the details of the gear and its working in the course of the investigation.

The route followed was from the Maudslay works in Coventry by way of the Stoneleigh Road and Stoneleigh Hill, which has an average grade of roughly 1 in 9, returning by another route on which there is a somewhat less steep but longer hill. At the outset we were favourably impressed by the manner in which the vehicle, the engine of which had seen considerable service, accelerated from a standstill and the ease at which it was handled in the traffic-congested streets through which it was necessary to pass before gaining the open road, the driver appearing to have a much easier and less exhausting time than would have been involved in the case of a vehicle fitted with the usual types of control. The hill climbing performance was excellent on each occasion and as the route did not include a really severe climb such as would have been possible had time permitted of a longer journey, the handbrake was fully applied on one of the hills to give the effect of a much steeper gradient. Even with this handicap the car proceeded at a steady rate to the summit and at the steepest part the handbrake was released without any tendency being shown for the car to move backwards, it being at the time set for forward running.

The road traversed included a fair mileage of narrow lanes and many sharp curves and under these conditions the vehicle was handled with more than ordinary facility, it often being difficult to detect when changes of gear ratio had taken place, whilst the absence of noise in a general sense and avoidance of anything in the nature of grating of gears was a pleasing and unique experience. We noticed something else which was very satisfactory, and that was the absence of vibration, or what is usually known as "shuddering," when starting away, especially on an up grade, smoothness of action being one of the principal features demonstrated with the Hobbs gear.

Trolleybus Workshop Wagons for London Transport

TO meet the servicing requirements of the rapidly-increasing fleet of trolleybuses now being placed in use by the London Passenger Transport Board, six new mobile repair workshops, working from various depots, are being introduced. Each vehicle will carry trolleybus spare wheels, a workbench with vice, tools, and trolleybus small spares and equipment.

Standard forward control petrol-engined Cub chassis, each having an 11-ft. wheelbase, are used in conjunction with specially constructed bodies designed to meet the requirements of London Transport; both bodies and chassis have been manufactured by Leyland Motors Limited, and the unladen weight of the complete machine registers below 50 cwt.

A large canopy immediately behind the driver's cab shelters two cupboards. The smaller cupboard is used for housing tools and is fitted with a bench top and vice, whilst the larger one is equipped with a number of partitions for carrying spares and equipment. Sufficient illumination is provided inside the canopy to enable night work to be carried out. A special long hinged tailboard positioned at the extreme rear corners of the body, facilitates unloading spare wheels. When the tailboard is dropped, the spare wheels can be rolled down a runway sunk in the body, over the tailboard and so to level ground.

Trolleybus equipment is also carried in long lockers built at each side of the body; access to these can be obtained both from inside the body by lifting hinged tops or from the outside by hinged side panels.

Two views of a new type of trolleybus-servicing mobile repair workshop now being introduced by the London Passenger Transport Board. Both bodies and chassis are products of Leyland Motors Limited

Road Transport Wages

(From our Staff and Labour Correspondent)

SIR JAMES MILNE, General Manager, G.W.R., appeared last week on behalf of the four main-line railway companies before the committee of inquiry appointed by the Ministers of Labour and Transport concerning the regulation of wages and conditions of service in the road motor transport industry (goods). He then presented a memorandum prepared on behalf of the railways, which drew attention to the fact that their direct participation in the road transport industry had existed for fully a hundred years, and claimed that their road transport departments, with their associated companies, were today the largest of the road transport undertakings in the country. (This memorandum was summarised at some length on pages 812 and 813 of last week's issue.)

A National Joint Conciliation Board for the road transport industry was established in 1934, and it was because of the difficulties caused by the non-observance by many operators of the board's decision that the Government committee was appointed. The board does not cover the road transport staff directly employed by the railway companies, but it was the case of the companies that such employees had for very many years been treated as regards organisation, remuneration, and conditions of service as an integral part of the railway staff. Their wages and conditions are determined by national agreements made with the National Union of Railwaymen, and it was also claimed by the companies that no industry possessed a more comprehensive machinery of negotiation than that in operation on the railways. This claim was endorsed by Mr. John Marchbank, the General Secretary of the National Union of Railwaymen, in his evidence, and the "hundred per cent. observance" of the railway national agreements is undoubtedly a powerful and convincing factor to be borne in mind by the committee in the consideration of the problems before them.

Sir James Milne expressed the opinion of the railway companies that it is in the public interest, and in the interest of the road transport industry as a whole, that the remuneration of the employees and their conditions of service should be effectively controlled by some proper machinery of negotiation, such as the National Joint Conciliation Board and its area boards and, in the case of the railway companies, the machinery already mentioned. The problem of road transport competition is still one of vital importance to the railway companies and, as they told the Government Committee, it is manifestly to their detriment as road operators, and to the detriment of their subsidiary road undertakings—and indeed of all road transport undertakings which conform to remuneration and conditions of service properly determined—that they should have to face the competition of undertakings which in no way conform to the remuneration and conditions determined by appropriate authorities.

The evidence given by the National Union of Railwaymen was mainly confirmatory to that of the railway companies, and, having also in mind the arguments and recommendations already submitted by the National Joint Conciliation Board, and by the trade unions represented on that body, it seems that a strong case has been made out for real and effective control of the wages and conditions of employment of all drivers engaged in the goods transport road industry.

Reorganisation in Northern Ireland

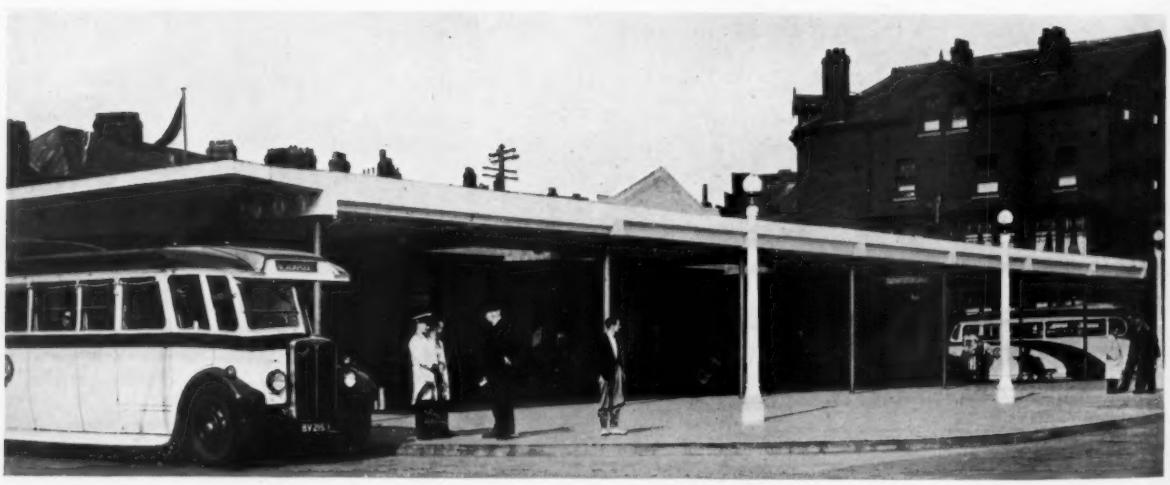
IT is just over a year since the Northern Ireland Road Transport Board began its working life, for, although it was incorporated on July 16, 1935, acquisitions began on October 1, 1935, when the undertakings of various large operators were taken over. These included the Belfast Omnibus Co. Ltd., and H. M. S. Catherwood Limited, together with the road fleets of the Great Northern Railway (in Northern Ireland only), the L.M.S.R. Northern Counties Committee, and the Belfast & County Down Railway. The total of vehicles involved was 583, comprising 434 buses and 149 lorries. Before the end of the calendar year almost all the passenger road transport undertakings in Northern Ireland (other than taxis, and the Belfast Corporation bus fleet, which was excepted from the scheme) had been taken over. The total number of passenger vehicles acquired was 687, and since January 1 last, when the bus acquisitions were practically completed, considerable economies have been effected by the amalgamation of services and the reduction of unnecessary mileage. The bus fleet has already been reduced from 687 to 550 vehicles; in addition, some vehicles due for scrapping were held in reserve until after July in case they were required to cope with the peak traffic during the July holidays. Such changes must necessarily be effected gradually, as it is of great importance there should be no dislocation of services in the process, and, while considerable progress has been made, it is recognised that the work of reorganisation is by no means ended.

There are 7,500 goods vehicles registered in Northern Ireland, of which 3,900 have an unladen weight of 30 cwt. or upwards. It is estimated that of these some 1,500 are used for the carriage of goods for hire, and these vehicles will in due course be acquired by the board. Up to June 3 of the present year the board had acquired only those goods vehicles which were worked in conjunction with passenger undertakings taken over, but on that date all vehicles operated in the area north and east of a line drawn from Belfast to Newtownards and along the east shore of Strangford Lough were acquired. In a recent article which Mr. D. L. Clarke, Chairman of the board, contributed to *The Times: Trade and Engineering*, he stated that it was intended to take over goods undertakings by areas, so as gradually to cover the whole country. Before an area was taken over, he pointed out, a complete organisation had to be set up which could be put into operation in a single night, so that there might be no break in the service to the public. The main objective was to provide adequate services, and at the same time to reduce to a minimum the wasteful running inevitable when a large number of independent owners were working in competition. The board is in a much more favourable position than the previous lorry owners to arrange for return loads, and thus avoid empty running. One of its most difficult problems is to cater adequately for the very heavy livestock traffic to and from Belfast, which is confined mainly to two days in the week. To avoid the expense and waste which would be occasioned by having lorries with bodies specially designed for this type of work, but not suitable for general purposes, the board has been experimenting with containers that can carry either cattle or sheep. These containers can be lifted off the ordinary flat body by means of a system of jacks, so that the lorry when not required for livestock can be used for ordinary purposes.

XUM

Frontage of the new Blackpool bus station, showing public entrances

Buses parked at the rear of the station during the recent holiday peak traffic. The permanent arrangement for vehicles is in the order shown in the plan on page 853



The arrival and departure platform at the rear of the station

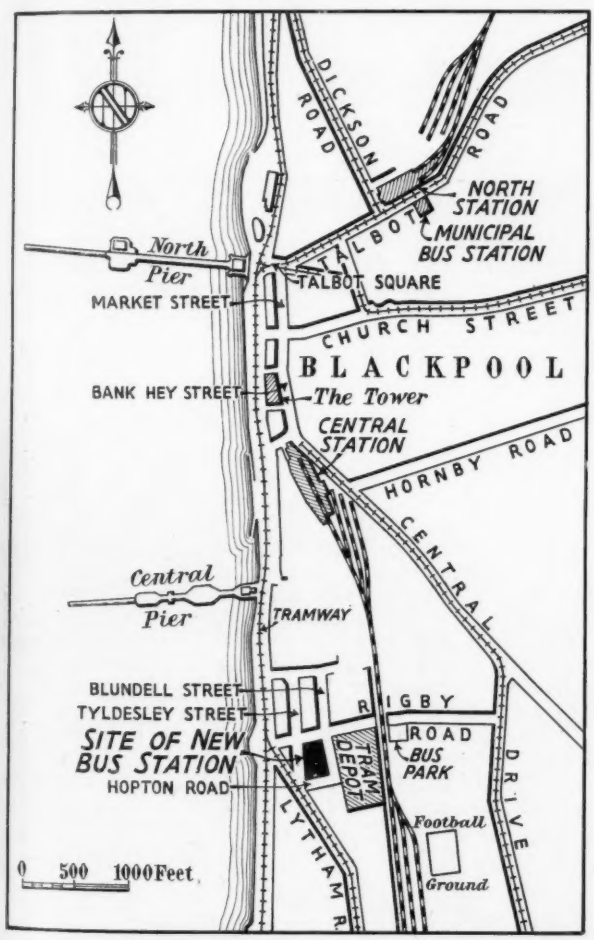
THE NEW BLACKPOOL OMNIBUS STATION

The New Blackpool Omnibus Station

This up-to-date station, owned by a group of railway-associated companies, deals with some of the most exceptional traffic in the country

AS briefly recorded on page 509 of THE RAILWAY GAZETTE for September 25 last, a new bus station for long distance services was opened recently by the Blackpool Omnibus Stations Limited—a joint subsidiary of a number of railway-associated road operating companies—on the site of the old Coliseum at the junction of the Tyldesley, Hopton, and Lytham Roads. The Coliseum, which in former days housed a variety of entertainments from time to time, had a 126 ft. umbrella roof which gave it a large interior floor space unobstructed by any supporting pillars. In recent years this unusual building passed into the hands of the Blackpool Omnibus Stations Limited and was used by the company as a car park; there was accommodation for some 2,500 cars. Profitable as this business proved, the rapidly increasing traffic to and from Blackpool necessitated the clearing of the site to make room for the new bus station. Previously most of the long-distance coaches had been parked in the large municipal bus station, but it had become increasingly evident that this was insufficient to cope with all the traffic, as, during the holiday peak periods, the side streets of Blackpool frequently became impassable owing to the presence of parked coaches.

The old Coliseum used as a parking garage before demolition



The location of the new bus station

Reference to the sketch map of Blackpool reproduced alongside shows that the new station has the initial advantage of being situated in the centre of the town, and also that it lies a little more than a hundred yards from the front. Built on a single floor level, except for a cellar accommodating the boiler equipment for central heating, the buildings are of simple but effective design. In addition to splendid office accommodation, there are all the necessary amenities for the travelling public. In the front of the building, on one side of a central arcade which is used as a waiting room, are the public enquiry and booking bureau and the manager's offices. Opposite, on the other side of the arcade, there is a well-equipped public restaurant. At the back of the building, looking out on the arrival and departure platforms, are a parcels office on one side and public lavatories on the other. In addition there are public telephone booths, and two kiosks rented to tobacconists and confectioners. Beyond the platform which is protected by a concrete awning, there is a large concrete area which can be used for parking a total of 62 buses. These, it is intended, should be drawn up tail to tail (not as shown in our illustration), so that any one bus may move off either towards the platform or into Blundell Street without causing the disturbance of any other vehicle. The company, incidentally, makes a charge of 2s. a day for buses parked in this space. Plans have already been prepared for extending the platform northwards, and, with this object in view, the housing property at present occupying the corner site bounded by Tyldesley Road and Rigby Road has been acquired. The scheme, when completed, will facilitate handling the huge crowds that assemble at peak periods, and it will also make the station a self-contained island site.

Interior of enquiry bureau and ticket office

The station restaurant showing, on the left, some of the special cooking apparatus

Special movable luggage racks in the station cloak room

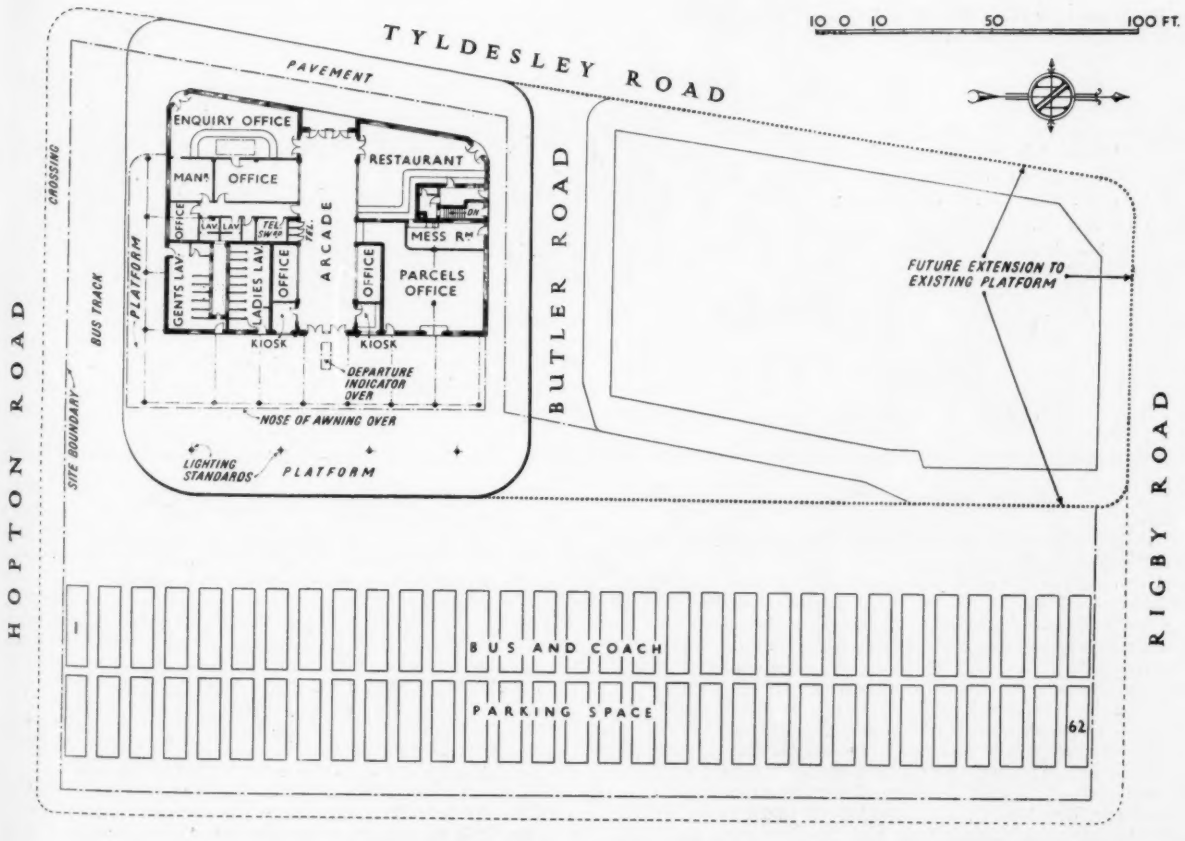
The central arcade which is used as a waiting room. The large glass roof gives a spacious appearance

The present traffic arrangements are that coaches should approach the station by way of Hopton Road, and then turn on to the concrete area behind the station building, discharging and picking up passengers at the platform frontage. Coaches which originate from, or are destined for the municipal bus station, which is situated near the North railway station and still used as a terminus for some routes, call at the side platform in Butler Road. With the demolition of the adjacent houses and Butler Road and the extension of the platforms northwards, these services will be dealt with at the Rigby Road frontage. A departure indicator is situated in the middle of the present platform to direct departing passengers. In normal circumstances, during the holiday season, some 200 to 300 vehicles arrive daily at the station from all parts of Lancashire, Yorkshire, the Midlands, Cumberland, Durham, Scotland, and North Wales. There are also, of course, a corresponding number of departures. At peak periods, such as August Bank Holiday or during the illuminations, these figures are nearly doubled. For the rest of the year the traffic is, in contrast, small, there being a daily average of about 70 or 80 vehicles using the station.

Of special interest in the new station are the cloakroom arrangements. It has become a habit of Blackpool landladies to stipulate that all luggage should be removed from lodgings before ten o'clock on the morning of departure. As, however, most visitors have comparatively short journeys home, many do not wish to leave the resort until late in the day. There is, therefore, an abnormal demand for cloakroom facilities. To meet this, special arrangements of a novel kind have been made in the new bus station. Racks, mounted on trolley wheels so that they may be drawn away from the walls to the receiving counter, have been installed, with the consequence that there is no delay resulting from the attendants having to take the luggage to the more remotely situated racks. Every rack is allotted a letter, and every shelf of a rack has a number. The attendant when issuing a ticket in exchange for any item, therefore indicates on the ticket the appropriate rack letter and shelf number. This, of course, facilitates the attendant's task when handing the luggage out again to the owner.

The restaurant, too, is deserving of attention from the transport point of view. Delay in service has been reduced to a minimum by the installation of special electrical cooking equipment. The toasting and grilling cookers, for instance, perform their work in two minutes.

We are indebted for assistance given in the preparation of this article to Mr. C. D. Quinn, Architect, Ribble Motor Services Limited, who was responsible for the design of the new station. The Ribble company, in which the L.M.S.R. has a large interest, holds, incidentally, 50 per cent. of the shares of Blackpool Omnibus Stations Limited. The other participants in the scheme are the East Yorkshire Motor Services Limited, the North Western Road Car Co. Ltd., the Yorkshire Traction Co. Ltd., the Yorkshire Woollen District Transport Co. Ltd., the Hebble Motor Services Limited, and the West Yorkshire Road Car Co. Ltd.



Plan of the new Blackpool bus station showing extent of proposed extension

Miscellaneous Notes

Road Transport in Hyderabad

A notification issued by the Nizam's Government states that the rapid growth of motor transport during the last five years has necessitated the enforcement of rules under the State Motor Vehicles Act to regulate the registration and licensing of motor vehicle transport. The fees proposed under the Act will provide a substantial revenue which will be credited to a special Road Fund to be worked by the Road Board, and this fund used to bring the condition of the principal roads up to modern requirements. It is intended that the passenger road services of the Nizam's State Railway will eventually replace all private services, excepting that such monopoly will not affect the motor vehicles plying in Hyderabad City. In regard to goods transport by road, the present policy of the Nizam's Government is to conserve to the village cartman as much carting as possible. A permit will, therefore, have to be obtained for the operation of goods transport vehicles for hire. The Railway Department proposes to inaugurate a certain number of goods services, particularly from trade centres to the nearest railway stations.

Co-ordination in the United Provinces

The Government of the United Provinces has constituted a provincial Board of Traffic and Communications, the functions of which will be to co-ordinate the activities and the policy of the controlling authorities appointed under the U.P. Motor Vehicles Rules of 1935. The Chief Commercial Manager of the East Indian Railway and a representative of the Bengal & North Western Railway will have seats on the board. In addressing the first meeting of the Advisory Communications Board of Sind, His Excellency the Governor of Sind referred to the various reports for the development of communications, on which the board had to examine a programme involving an expenditure of Rs. 30 lakhs in five years. The original Parikh report was framed without regard to finance, but this had been borne in mind by the subsequent Stubbs report, which was substituted for the original Parikh report, and now there was the revised Parikh scheme as a first instalment of the Stubbs proposals. The Governor admitted that there was nothing spectacular in the present proposals which were, for the most part, directed towards increasing facilities for the conveyance of goods and passengers to railway stations. Under the road policy of the Government of India, funds received from it had to be spent on the development of railway feeder roads. The local government was not permitted to make it possible for motor traffic to enter into competition with the railways. His Excellency pointed out the special advantages of road motor transport for the conveyance of bulky articles such as raw cotton and sugar cane from the fields to the manufactories.

Milk transport road-rail trailer, manufactured by R. A. Dyson & Co., Ltd. This vehicle, complete with road wheels and tyres, is loaded on a special rail truck, as described and illustrated in our issue of June 2, 1933

Publications Received

The Invention of the Automobile (Karl Benz and Gottlieb Daimler). By St. John C. Nixon. London: Country Life, Limited, 20, Tavistock Street, W.C.2. 8¾ in. × 5½ in. 143 pp. Illustrated. Price 7s. 6d. net.—No invention of recent years has so profoundly affected the trend of civilisation as the internal-combustion engine, and in particular its application to transport. The earliest practical automobiles appeared but half a century ago, and therefore well within living memory, yet already the facts have become obscured and some controversy has arisen as to who was the "inventor." As with all such questions, the first point requiring decision is whether pioneer honours should be accorded to the first man to devise an apparatus, or should be reserved for the one who produces something, develops it, and applies it successfully to the purpose intended. From both the common-sense and commercial viewpoints, the latter is the true father of his industry, and on these grounds the claims to have invented the automobile undoubtedly are between Karl Benz and Gottlieb Daimler. Of course, there were earlier experimental motor-cars (even excluding steam), notably those of the Austrian, Siegfried Markus, one of which was exhibited at the Vienna Exhibition in 1873, but there were no immediate results, and it is improbable that the work of Markus was even known to Benz.

Mr. St. John Nixon has chosen a happy time for the production of his volume, as it is just forty years since the coming into force of the Locomotives on Highways Act of 1896 lifted the more burdensome restrictions of the "Red Flag" Act of 1865 and made road motor development possible in this country. The author's work consists of a very readable and well-documented account of the lives and work of Benz and Daimler. It is generally favourable to the claims of Benz, but by no means unfair to the work of the far less conservative Daimler. A two-column chronological table sets out in juxtaposition the important events in the careers of the two inventors. No student of early motor-car history can afford to miss securing his copy of this notable book, while the more general reader may find in it a story full of fascination and human interest.

NEW AIR-CONDITIONED COACHES FOR MALAYA

Two new first class carriages for the F.M.S.R. are fitted with complete air-conditioning equipment

TWO first class carriages of special design and fitted with Stone's electro-mechanical air-conditioning equipment, have been built by the Birmingham Railway Carriage & Wagon Co. Ltd., for the metre-gauge Federated Malay States Railways, to the specification and requirements of the Chief Mechanical Engineer, Mr. A. W. S. Graeme, and to the order and under the supervision and inspection of the Crown Agents for the Colonies. The following are the leading dimensions:—

Length over body	60 ft. 0⅜ in.
Length over vestibules	62 ft. 6 in.
Width of body at waist	8 ft. 10$\frac{11}{16}$ in.
Height from rail to top of roof	11 ft. 8 in.
Centres of bogies	42 ft. 0 in.
Bogie wheel base	6 ft. 6¾ in.
Diameter of wheels	2 ft. 9½ in.
Buffer height from rail, light vehicle	1 ft. 10¾ in.

The specially insulated body and the underframe, built integrally, are of all-steel construction. The floor consists of a double layer of tongued and grooved teak boards with an insertion of cork insulation between. The walls of the body are double with an air space between them, and cork is the insulating material used generally. Bon-ply birch sheets are used for the interior panelling from floor to cantrail, and the ceilings are of Sundeala. The interior decoration is of Rexine, and this, together with the final painting and varnishing, will be applied after the vehicles reach Malaya, where the chairs, tables and other interior furnishing will be fitted. There are two large open saloons with accommodation for twelve and eight passengers respectively, a small four-passenger compartment, and lavatory. Entrance to the coach is by means of end vestibules.

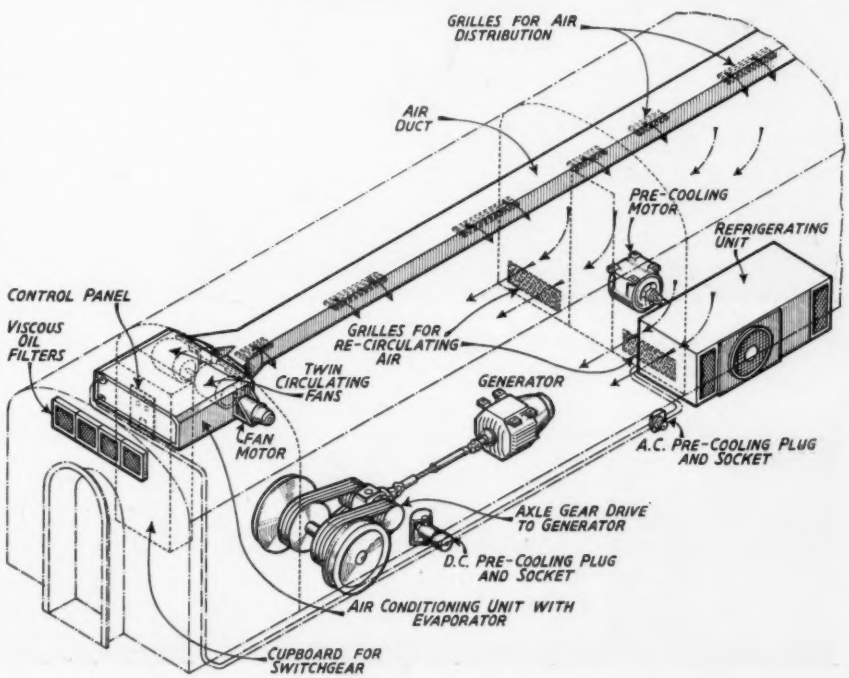
Double lights are provided at each window opening. They are normally fixed, but the inner lights, fitted with budget locks, are so arranged that they can be easily removed to clean the glass. In addition, several of the exterior windows are arranged so that they can be hinged inwards for ventilation if occasion demands. Roller blinds in Pantasote are provided at each window. All the electric lighting fittings have been supplied by J. Stone & Co. Ltd., and are of the new Luxton type with opal non-glare glassware. The current for these is taken from the generator and battery, which forms part of the air-conditioning plant.

Automatic vacuum brake with two Prestall cylinders is fitted, and there are passenger alarm signal discs of the railway company's standard in the saloons. The bogies, which have Hyatt roller bearing axleboxes, are of the equalising beam type with quadruple elliptical bolster springs and triple coil side springs.

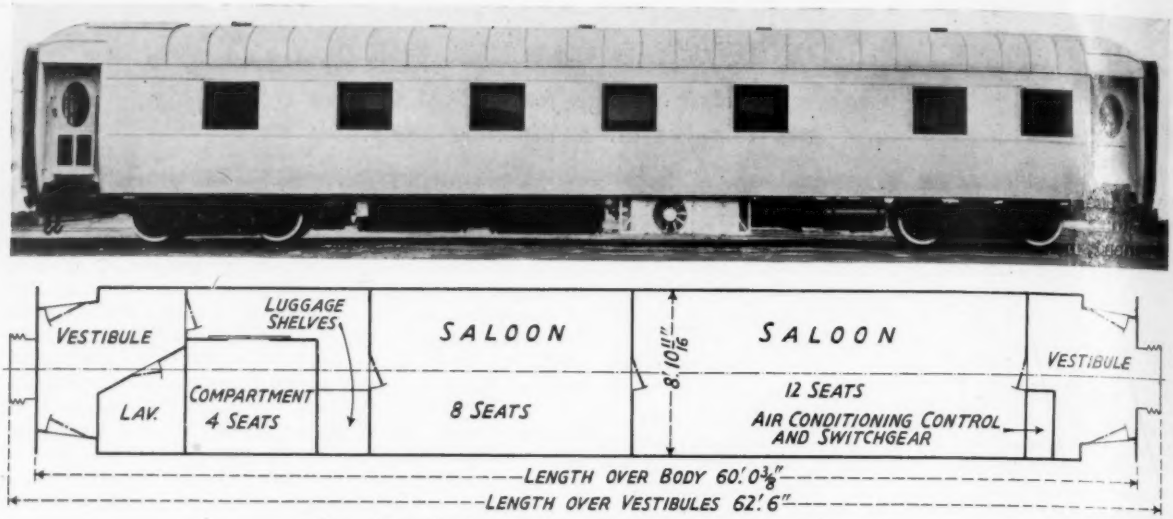
Air-conditioning

The air-conditioning equipment is designed to provide an ample supply of fresh air, free from dust, for the 24 passengers, and to maintain automatically the correct temperature and degree of humidity inside the compartments so as to give comfortable travelling conditions, without draughts, at all seasons of the year in Malaya. The accompanying diagram illustrates the operation of the equipment. The fresh air, drawn through louvres in the vestibule doors, passes up through a grille in the vestibule ceiling, and after the dust and dirt have been extracted by passing through viscous oil filters, it passes over the cooling coils of the evaporator, where a proportion of the moisture in the air, condenses on the cold surface, and at the same time the temperature is reduced to the required level, according to the setting of the thermostatic control. The air is then drawn into twin centrifugal fans, forced through ducts in the double roof, and passes into the compartments through grilles which give even distribution without draughts throughout the vehicle. A portion of the air escapes to atmosphere, through small grilles in the body sides near floor level, owing to the slight pressure produced by the centrifugal fans, and the remainder returns, through grilles at the bottom of the partitions, to the vestibule end and up to the roof behind the control panel, to be recirculated.

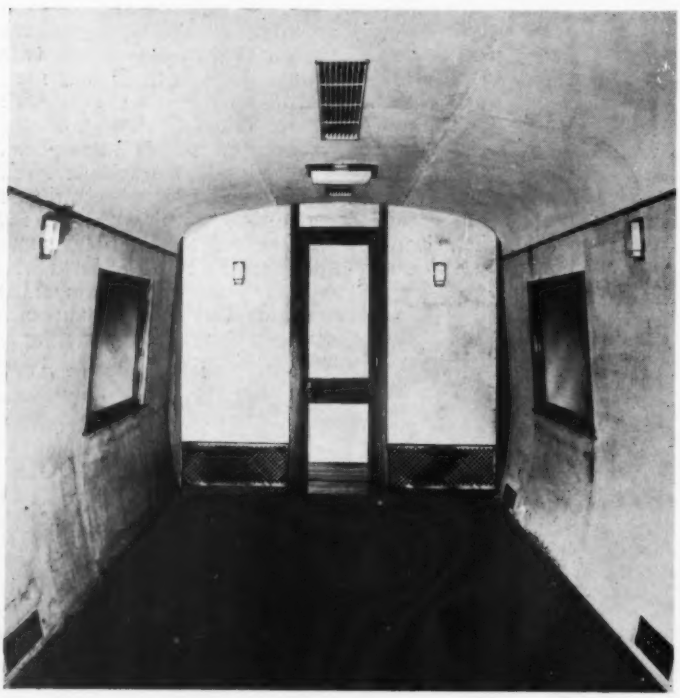
The refrigerating unit and the evaporator, operate on the normal compression system using Freon (dichlorodifluoromethane) as the refrigerant, which is non-toxic, non-irritant, and non-inflammable. The conventional refri-



Isometric drawing of air-conditoned coach for Malaya

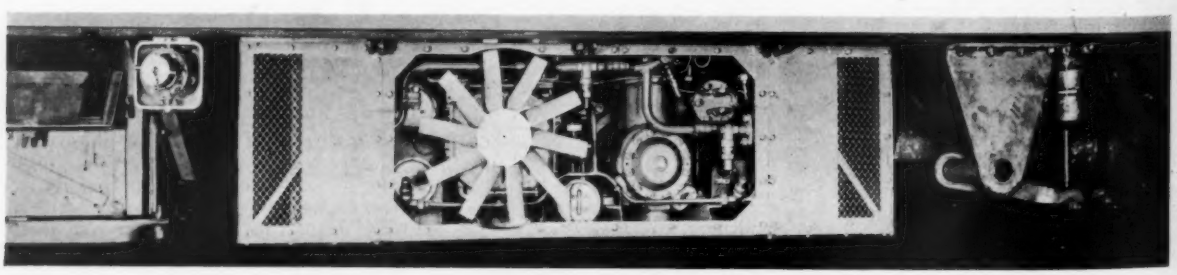


View of coach showing part of air-conditioning equipment

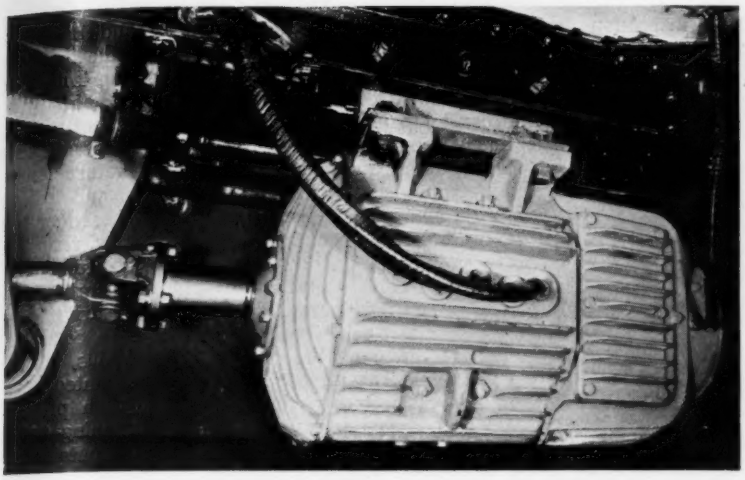


Interior showing conditioned-air grilles in ceiling and re-circulating air grilles in partitions at floor level

Cupboard containing air-conditioning control and switchgear



Refrigerating unit with covers removed



Tonum generator

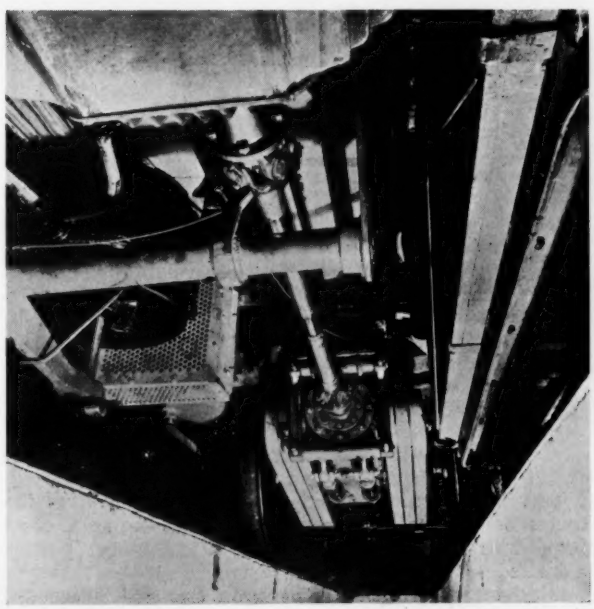
gerating circuit is shown herewith. The Freon is circulated throughout the closed circuit by the compressor, and passes from the liquid receiver through a small orifice in the expansion valve, and then to the evaporator coil. Since the evaporator coil is connected to the suction side of the compressor, there is a reduced pressure in the evaporator, and liquid Freon passing into it, vaporises into a gas. In changing its state from liquid to gas, it absorbs heat from the air passing over the coils. The gas is drawn into the compressor and compressed, which operation raises its temperature. The hot compressed gas then passes into the condenser coils where the heat extracted from the air in the car, plus the work converted into heat when the gas is compressed, is transferred to a continuous stream of atmospheric air passing over the condenser coils. The compression of the gas condenses it into a liquid which is collected in the liquid receiver, thus completing the cycle.

The axle-driven generator supplies the power for driving the compressor and circulating fans for air-conditioning, as well as the lighting and battery charging, thus making the whole plant self-contained and not dependent on any other carriage or the locomotive. For pre-cooling, an a.c. motor is fitted which enables the plant to be run from a local a.c. supply at terminal stations. It can also be used in emergency to charge the batteries. Should the local supply be d.c., it is connected direct to the cooling motor. The sockets for plugging in local circuits are arranged to swivel so that, in the event of the train starting before disconnection, the plug is automatically pulled out.

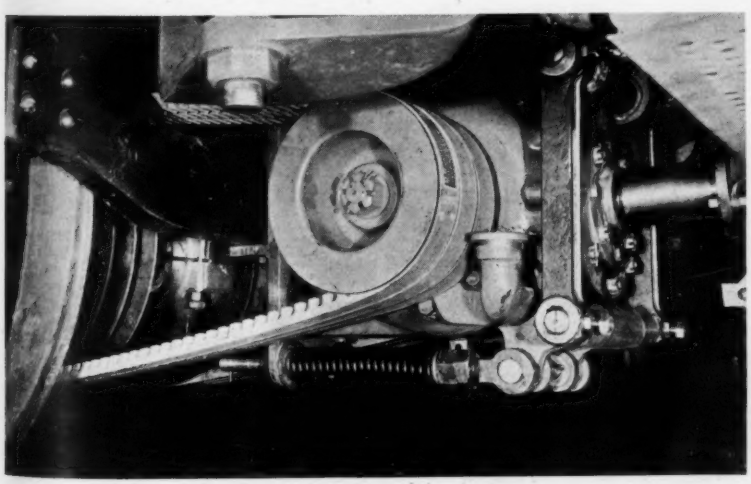
It will be seen from the disposition of the various details of the air-conditioning equipment that there is no reduction of passenger accommodation. The air-conditioning unit, with the evaporator and the ducting, are situated in the roof, the control switchgear in a cupboard in the vestibule and all the rest of the apparatus is suitably disposed on the underframe. The total weight of the equipment is about 5 tons, inclusive of the battery.

The generator gear drive from the axle is by means of vee belts to a gearbox suspended on the bogie headstock. There are two axle pulleys, each having three vee belts, and the gearbox is carried on four suspension links attached to the bogie headstock. The links permit the correct tensioning of the belts by means of springs. The gearbox contains a pair of spiral bevel wheels running in oil. The crown wheel shaft carries the two belt pulleys and the pinion shaft carries the coupling for the propeller shaft. The generator is driven from the gearbox by means of a telescopic propeller shaft with universal joints at each end. This form of axle gear drive is very robust, quiet in operation, and flexible in application.

The Tonum type generator operates efficiently over a wide range of speed. It is totally-enclosed, dust and water-



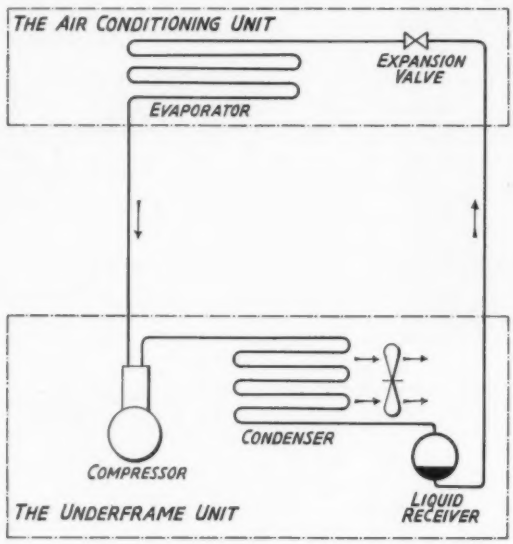
Looking upwards from inspection pit at gearbox and drive to generator



Generator gear drive

XUM

tight. The generator is provided with large inspection covers in the commutator end shield to permit easy access to the brush-gear. The brushes are fixed in position, and reversal of rotation is compensated for electrically. The pre-cooling motor is of normal design for working on an a.c. supply at 400 volts, 3 phase, 50 cycles.



Refrigerating circuit

The storage battery, with a capacity of 520 ampere-hours at 48 volts, is composed of Stone's No-Wash cells, which are specially light in weight, and require the minimum of attention. The power for the air-conditioning equipment is taken from the generator and battery at 48 volts, but the lighting load is divided on the three-wire system so that standard 24-volt train lighting lamps and fittings can be used.

The control panel is divided into two distinct sections. The master control switches operated by the attendant for starting the equipment and for temperature control are mounted together in the upper section, and exposed to view through a glass window in the cupboard situated in the vestibule. The contactor switches, fuses, terminals, &c., are mounted in the lower section and are fully accessible when the cupboard is open. The refrigerating unit, mounted on the underframe, contains a motor-driven twin-cylinder vertical single acting compressor, the condenser, with fans for directing the air through the coils, and the liquid receiver. The pre-cooling motor is mounted alongside and is connected to the compressor by a propeller shaft with universal joints. The air-conditioning unit is situated above the vestibule ceiling and contains the evaporator, the two centrifugal fans driven by an electric motor, the expansion valve, and the viscous oil air filters.

A demonstration of one of these coaches at the Smethwick works of the Birmingham Railway Carriage & Wagon Co. Ltd. has been attended during the past week by numerous railway officers, and is referred to editorially on page 832.

DR. BOSCH'S JUBILEE.—Dr. Robert Bosch, of magneto fame, was honoured at Stuttgart on September 23 on the occasion of his seventy-fifth birthday and the fiftieth anniversary of the establishment of his works. Representatives of the State Nazi Party, and the armed forces, guests from other countries, and several thousands of Bosch employees took part in the celebrations. Dr. Schacht, the Reich Minister of Economics, eulogised Dr. Bosch's qualities as an industrial leader.

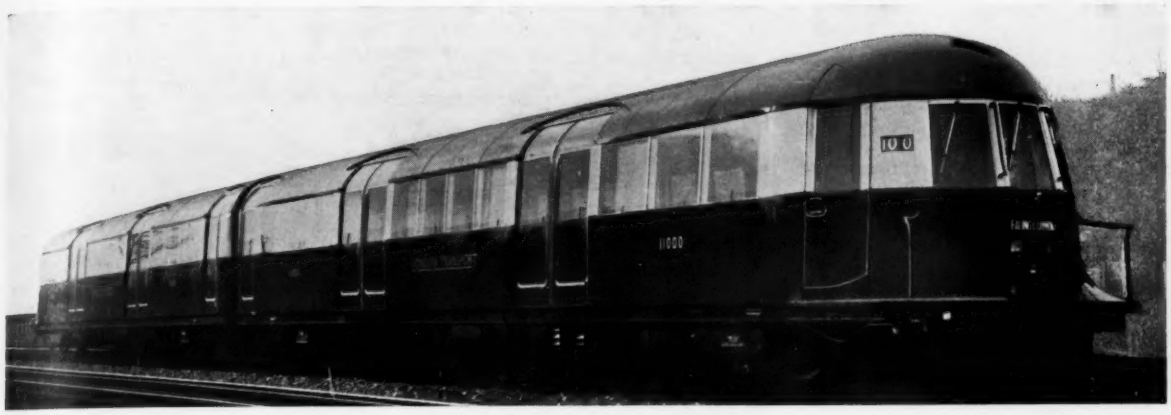
Station Dormitories on the Swedish State Railways

Travellers by night whose journeys lie away from the routes of the through sleeping car expresses, are often faced with spending some of the least animated hours at an interchange station, waiting for an early morning train to their destination. The best waiting room does not afford quite the accommodation that might be desired at such a time, so the Swedish State Railways now provide dormitories at certain stations for the benefit of passengers who are thus temporarily marooned. Our illustration, showing some of the berths at Falköping, gives an idea of the praiseworthy lines upon which this accommodation has been planned, particularly in such matters as ample room for occupants of lower berths, a ladder to climb into the upper, and provision for washing. But what may well be considered the most striking feature of the scheme is the fact that the charge for a night is only sixpence, including a rug and a pillow. With good rest assured at so cheap a rate, many people should be encouraged more often to undertake journeys which they have hitherto been inclined to defer until such time as they could perform them during the day.

Reference to Swedish pioneering with third class sleeping cars was made in our issue of September 4.

FASTER TRAINS FOR LONDON UNDERGROUND

1,656 *h.p. six-car sets with varying electrical equipment*



One of the four new 600-volt d.c. trains for the London Passenger Transport Board

FOUR electric trains are to be introduced on the Piccadilly line of the London Passenger Transport Board within the next few weeks, and by reason of their higher acceleration and retardation rates and a greater passenger accommodation they will enable the capacity of that line to be increased. Ultimately it is hoped that if and when a complete section can be operated with trains similar to these, the capacity will be increased to 45 trains an hour compared with the present figure of 40.

The four new six-car trains, built by the Metropolitan-Cammell Carriage & Wagon Co. Ltd., are regarded as experimental units, in order to decide the form the equipment shall take on the large number of new vehicles which the board will require later. The principal feature is that all the electrical equipment is located beneath the floor, and by the suppression of the normal equipment compartment the carrying capacity of the six-car train has been made equivalent to that of a seven-coach set of normal construction.

The 138 h.p. motors of all the trains have been made by Crompton, Parkinson & Co. Ltd., but each train has a different system of control, evolved and manufactured by the Metropolitan-Vickers Electrical Co. Ltd., the British Thomson-Houston Co. Ltd., the General Electric Co. Ltd., and Crompton, Parkinson & Co. Ltd. respectively. The first make has an oil-driven power drum for performing all resistance switching, and giving a total of 45 notches. B.T.H. has put forward the American PCM system incorporating a number of air-operated units controlled by magnet valves. The G.E.C. system includes a camshaft driven by a servo motor and giving a total of 56 notches in series, parallel and weakened field grouping. The Crompton-Parkinson method makes use of two face-plate controllers, one for each motor circuit, which give 19 notches in series, in parallel, and in parallel with weakened field, but this firm has proposed also two further schemes, one similar to the last but without series grouping, and the other with a motor-driven camshaft cutting out the resistances.

Increased acceleration, up to 2·0 m.p.h.p.s., has been achieved by motoring half the axles down the train, thus giving greater adhesion weight; by a reduction in train weight; and by a multi-point control apparatus which allows the accelerating current to be increased nearer the slipping point by the reduction of peaks. The braking system has been given special attention, and as all the electrical equipment is beneath the floor the usual form of underframe brake rigging is impossible. The type of electro-pneumatic brake fitted was evolved by the Westinghouse Brake & Signal Co. Ltd. in conjunction with the Underground engineers, and gives a retardation rate of

Interior of new train for the Piccadilly line

3·0 m.p.h.p.s. It comprises independent wheel braking with two shoes per wheel and one cylinder per shoe.

Each car is 52 ft. 6 in. over headstocks and has a normal seating capacity of 40, the seats themselves being of the pattern used on the Green Line road buses. The underframes are of welded steel sections with the centre longitudinals forming the air ducts for the experimental forced ventilation of the Stone type, which is being fitted to two cars of the first train. Here the usual ventilators above the windows have been eliminated, and the windows have fixed double glasses with an air space between. The bogies also are of welded steel construction, and the axleboxes are of the Hoffmann roller type. Timken roller bearings are used for the bogie pivots. Three of the trains have rounded ends and dead smooth panels, and Wedglock automatic centre couplers are fitted to all four trains; these couplers were described in THE RAILWAY GAZETTE of February 14, 1936, page 289.

Concrete is being used on a large scale for railway work in Brazil at the present time, as the illustrations of the remarkable reinforced-concrete underbridges on page 669 of our issue of October 23 indicated. In order that thorough and uniform mixing may be assured the most modern concrete mixing plant is used, and the picture alongside shows two large rotary concrete mixers recently constructed by Ransomes & Rapier Limited at Ipswich for the San Paulo Railway. These mixers are fitted with automatic water tanks to provide uniform water content, and batch timers which ensure a minimum mixing time for each batch of 30 cu. ft. unmixed and 21 cu. ft. mixed. The mixers are electrically driven and incorporate all the latest refinements

Dining car on one of the interurban tramway lines at Düsseldorf

RAILWAY NEWS SECTION

PERSONAL

It has been officially announced that Mr. S. J. Symes has been appointed Acting Chief Mechanical Engineer, L.M.S.R., in the temporary absence of Mr. Stanier.

Mr. J. E. Kitching, who, as announced in our issue of November 6, has been appointed Portmaster, Grimsby and Immingham, L.N.E.R., entered the service of the former North Eastern Railway in the Chief Goods Manager's Department in 1908. After spending some time at Hull and other stations he was appointed Assistant District Goods Manager, Newcastle-on-Tyne, in 1914. During the war Mr. Kitching served in France with the 17th Northumberland Fusiliers (Pioneers), and under the Director General of Transportation, and on demobilisation in 1919 he entered the Development Department of the Ministry of Transport. Rejoining the service of the North Eastern Railway in 1921, Mr. Kitching was in the following year appointed Dock Superintendent, Tyne Dock, which position he relinquished in 1923 to become District Goods Manager at Middlesbrough, L.N.E.R. In 1925-26 he visited Australia and New Zealand to investigate the possibilities of developing trade between those countries and the East Coast ports of England, and it was in 1928 he was appointed District Goods Manager, Newcastle-on-Tyne, the position he now vacates to go to Grimsby and Immingham as Portmaster.

Mr. J. E. Kitching,
Appointed Portmaster at Grimsby and Immingham, L.N.E.R.

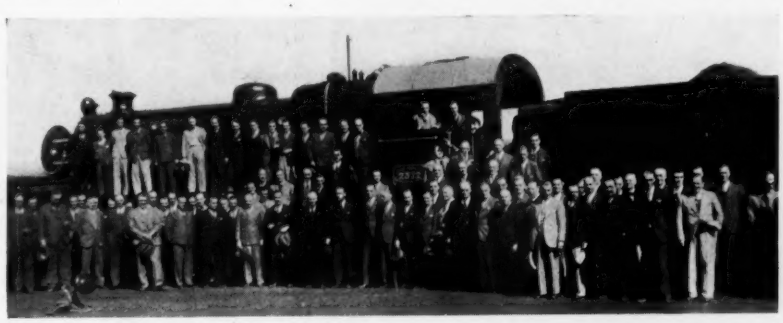
Photo] [Lafayette

Mr. W. G. Hornett,
Appointed Assistant Managing Director, Sentinel Waggon Works (1936) Limited

Sir Austen Chamberlain, M.P., has joined the board of the General Electric Co. Ltd.

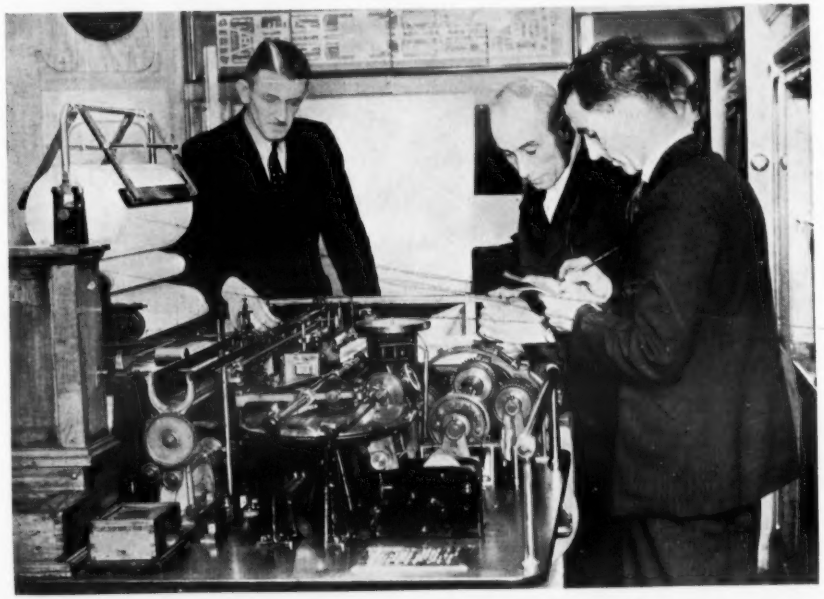
Mr. W. G. Hornett, who has been appointed Assistant Managing Director of the Sentinel Waggon Works (1936) Limited, began his engineering career on the Great North of Scotland Railway. After serving the usual apprenticeship of seven years, his first appointment was that of draughtsman at Kittybrewster works. He gained valuable experience of ordinary mechanical departmental work, and also on the mechanical side of the Civil Engineer's Department, upon bridgework, signal cabins, &c., undertaken by the Locomotive Department. After being Assistant to Mr. Robert Gordon Sharp, who laid out and equipped the Inverurie works of the G.N.S.R., Mr. Hornett was, in 1905, selected by Mr. A. C. Carr, as Assistant Works Manager of the Khargpur shops of the Bengal-Nagpur Railway. His next appointment was as Superintendent of the Technical Branch of the Chief Mechanical Engineer's Department of that system, and he was finally promoted to be Carriage and Wagon Superintendent. When at home on leave in 1920, it was arranged that Mr. Hornett should take an extension of 12 months' leave, during which he was engaged at the Nottingham works of Cammell Laird & Co. Ltd., on 40 London Electric cars and also upon the 12-ft.-wide electric stock for the G.I.P.R. During his service on the B.-N.R. he had further experience in the laying out and extension of Khargpur shops under Mr. Carr. In 1923 Mr. Hornett was selected by the Railway Board first as a member of the special committee upon automatic couplers in India, and in the following year to take charge of rolling stock standardisation on all gauges, upon which he duly reported in 1925. As a result, he was then deputed, whilst at home on leave, to take charge of the preparation of designs and specifications for standard stock, his duties terminating in 1929 when the Standards Committee was formed in India. Mr. Hornett was afterwards offered and accepted a post with Heatley & Gresham Limited of Calcutta, Bombay, Madras, and Lahore, with which was combined that of Indian representative of Gresham & Craven Limited (Manchester); this he now vacates to go to the Sentinel Waggon Works. He had always specialised in organisation schemes for the education of apprentices, and had gained two silver medals at the City & Guilds of London Institute. Mr. Hornett has been a Member of the Institution of Mechanical Engineers since 1909, and a Member of Council and of the Selection Committee of the Institution of Locomotive Engineers for many years.

Lt.-Col. H. C. Prescott, C.M.G., C.I.E., who, as announced in our issue of November 13, has been appointed Chief of Police, Southern Railway, in



Group taken during the visit of the South American centre of the Institution of Locomotive Engineers to the Mendoza shops and sheds of the B.A. & Pacific Railway (see page 839)

The down trial train passing King's Langley at 80 m.p.h. Mr. R. A. Riddles may be seen on the footplate of the "Princess Elizabeth" and the dynamometer car is the vehicle behind the tender



Left: Interior of the dynamometer car. Checking up on the instruments before leaving Euston. Right: The trial train ascending Shap bank at just 60 m.p.h.

L.M.S.R. SIX-HOUR SCHEDULE TRIAL RUNS LONDON—GLASGOW AND GLASGOW—LONDON (*see page* 866)

succession to Mr. R. Duckworth, was born in 1882, and educated at Bedford Modern School. Serving in the Indian Army with the rank of Lieutenant-Colonel, he retired in 1928, and was appointed Inspector-General of Police, Iraq. He served in South Africa from 1901-2, and during the great war in Mesopotamia, when he was mentioned in despatches.

From *The London Gazette* of November 10: Regular Army, Supplementary Reserve of Officers; Royal Engineers, Transportation: Capt. R. H. Edwards to be Major, and Lt. V. R. Illingworth to be Captain (October 6).

Major Edwards is the Resident Assistant Engineer, Bute Docks, Cardiff, and on promotion is appointed to command the 151st. (G.W.) Railway Construction Company R.E. (S.R.). Capt. Illingworth is Engineering Assistant on the staff of the Chief Engineer, G.W.R., at Paddington.

Mr. Arthur Collinson who has been Assistant Superintendent of the North Eastern Area, London & North Eastern Railway, since 1923, and for twelve previous years had been Assistant Superintendent of the former North Eastern Railway, is retiring on November 26 on reaching the age limit of 65. Mr. Collinson began his railway career as a mechanical engineer, and from 1889 to 1893 served an apprenticeship at Gateshead works as a pupil to the late Mr. T. W. Worsdell, and subsequently the late Mr. Wilson Worsdell, successive Locomotive Superintendents of the North Eastern Railway. From 1894 to 1897 Mr. Collinson was Chief Inspector of Materials, and from 1897 to 1900 his duties were extended to include that of Chief Boiler Inspector. From 1900 to 1903 he was Works Manager at the Queen Street locomotive works, York, and when these works were closed, and the new construction and heavy repair work, previously carried out there, were concentrated at Darlington, he was appointed an assistant to Mr. Vincent Raven, then Assistant Locomotive Superintendent at Gateshead. In 1905, at the invitation of the late Sir George Gibb—who had recently retired from the General Managership of the North Eastern Railway to become Chairman and Managing Director of the Metropolitan District Railway and associated Underground companies—Mr. Collinson was appointed Manager of the Metropolitan District Railway, which post he held for nearly three years. In 1908, however, he returned to the service of the North Eastern Railway, being appointed District Superintendent at Middlesbrough, and in 1911 was appointed Assistant Superintendent of the whole system, which in January, 1923, became the North Eastern Area of the present L.N.E.R., and in which he has continued to serve in the same capacity until now.

We regret to record the death, in an aeroplane accident near Jodhpur, of Mr. R. A. Tarleton, Deputy Locomotive Superintendent, Jodhpur Railway.

Mr. G. Anson Bayley has been appointed Chairman of the board of directors of the Bengal Dooars Railway Co. Ltd. in succession to the late Sir Henry P. Burt, K.C.I.E., C.B.E.

INDIAN RAILWAY STAFF CHANGES

Mr. G. E. Berkley, Officiating Chief Traffic Manager, G.I.P.R., has been granted one year's leave as from October 5.

Mr. L. Barber, Chief Electrical Engineer, G.I.P.R., has been granted two years' leave prior to retirement, as from October 5.

Mr. J. H. Cardew, Deputy Locomotive Superintendent, Burma Railways, has been granted nine months' leave as from October 8.

Mr. J. C. Highet, F.C.H., Officiating Member, Railway Board, is appointed to officiate as Member (Staff) with effect from October 12.

Lt.-Col. H. H. E. Gosset, R.E., Officiating Deputy Chief Engineer, E.B.R., has been granted one year's leave as from October 15.

Mr. S. B. Ram Singh, Officiating Deputy Chief Engineer, N.W.R., has been granted six months' leave as from October 16.

Mr. C. G. W. Gordon, Chief Commercial Manager, M. & S.M.R., has been granted six months' leave as from October 14, and Mr. T. Stephenson, Deputy Agent, has been appointed to act in his place as Chief Commercial Manager.

Mr. R. Hannay has been confirmed as Traffic Manager, B. & N.W. and R. & K. Railways, as from June 1.

Mr. F. J. White, General Manager of the Guayaquil and Quito Railway in Ecuador, is on a visit to this country.

PRESENTATION TO MR. RIDLEY

At a luncheon held in the North British Station Hotel, Edinburgh, on November 17, Mr. George Mills, Divisional General Manager, Scottish Area, L.N.E.R., on behalf of the Isle of Skye Hotel Proprietors' Association, presented a silver salver to Mr. N. Ridley (who recently retired from the position of Scottish Area Advertising Representative, L.N.E.R.), in recognition of all that he had done in conjunction with the association and the L.M.S.R. to advertise the Isle of Skye.

Mr. James Simpson, Royal Hotel, Portree, and Mr. Charles Campbell, Campbell's Hotel, Broadford, both paid tribute to the service Mr. Ridley had rendered the island in bringing its attractions so successfully before the public.

Railway Staff and Labour Matters

Railway Shopmen—Rate of Pay of "Graither"

Cases affecting railway grades now come but rarely before the Industrial Court, so that the Court's Decision No. 1669, which has just been published, is of interest, mainly, however, by reason of the fact that it deals with a little known grade, *i.e.*, "graither." The National Union of Railwaymen and the Mersey Railway Company were parties to the issue, and the Court was asked to determine the claim of a labourer employed at the Mersey Railway power and pumping stations, Shore Road, Birkenhead, that he should be graded as graither and paid the rate of 60s. a week applicable to that grade.

"The Dictionary of Occupational Terms," published by H.M. Stationery Office, defines a "graither" as a "pump doctor," or, in other words, a man who "makes periodical examination of pumps and renews packing in glands." The rates of pay and conditions of service of railway shopmen, generally, were settled by the Industrial Court in 1922 by its Decision No. 728. The Mersey Railway was not a party to the proceedings leading up to Decision No. 728, but has since adopted the provisions of that award as part of the conditions of employment of its railway shopmen.

In applying that award to a graither employed by the railway in connection with the maintenance of its steam pumps the company, in the absence of any rate in the award for such a grade of workman, paid to the graither concerned a basic rate of 44s. plus cost of living bonus of 16s. 6d. Subsequently, the duties upon which the man had been employed were altered by the introduction of two electric pumps, with the result that the full time employment of a graither was not required, and since 1931 the work has been done by the man concerned in the present case. This man is rated as a labourer at 29s. plus 16s. 6d. bonus, but when employed on the work formerly done by the graither on the steam pumps and when assisting electrical fitters on repairs to the electric pumps, he is paid at the rate previously paid to the graither. The Court decided that the man in question should be paid at the basic rate of 38s. a week, plus bonus, for all time worked.

Meeting of Railway Staff National Tribunal

It is understood that the Railway Staff National Tribunal will begin the hearing of the claims of the Associated Society of Locomotive Engineers and Firemen for a six-hour day and variations in wages and conditions, on Monday, December 7, at Montagu House, Whitehall, London, S.W.1.

L.M.S.R. SIX-HOUR SCHEDULE TRIAL RUNS LONDON—GLASGOW AND GLASGOW—LONDON (see page 866)

XUM

British Railways Joint Receiving Offices Competition

(*See also editorial note on page* 831)

On Monday last, November 16, in the unavoidable absence of Sir Josiah Stamp who was engaged on Government business, Mr. R. Holland Martin, Chairman, Southern Railway, opened an exhibition at the Royal Institute of British Architects, Portland Place, of designs submitted in the competition organised by the four group railways for designs for British Railways joint town receiving offices for the conduct of passenger business, and parcels and goods traffic. The competition was organised consequent upon the four group railways deciding to reduce the present number of town offices by providing joint offices in place of those at present run separately. The exhibition remains open until November 25. Some 34 designs were submitted, and the competition assessors—Mr. Charles Holden, F.R.I.B.A., Mr. L. H. Bucknell, F.R.I.B.A, Mr. W. H. Hamlyn, F.R.I.B.A. (Architect, L.M.S.R.), and Mr. C. Grasemann (Public Relations Officer, Southern Railway)—made the following awards:—

First prize (£300), Mr. H. T. Cadbury-Brown, A.R.I.B.A.

Second prize (£125), Messrs. P. J. Westwood & Sons, F/A.R.I.B.A.

Third prize (£50), Miss Beryl Bickerton and Miss Zoe T. Maw.

Fourth prize (£25), Messrs. Eric Galloway and Austin Vowell.

Mr. Percy Thomas, President of the Royal Institute of British Architects, welcoming Mr. Holland Martin, Lord Palmer, and a large gathering of railway officers at the opening ceremony, said that architects were indebted to the railways for the public spirited way in which they had conducted the competition. He hoped that other great industrial undertakings would follow.

Mr. Holland Martin, in declaring the exhibition open, said that he thought that the railways had done the right thing in going out to meet the architect. The response had not only proved that such competitions were popular, but also that they gave young architects an opportunity to make themselves known. The design required by the railways was rather a difficult one, for it was necessary that the public should know the town office as a place where help and advice could be obtained. It was not easy to make this apparent in the window, and therefore much depended upon the offices behind. An appreciation of this had been shown by the competitors, who had also responded well to the request for a standard design which would not startle. Pugnacious architecture was never good, and the railways had sought a frontage which would harmonise easily with existing buildings in almost any surroundings. Mr. Holland Martin then presented the prizes to the respective winners, and concluded the ceremony by thanking Mr. Percy Thomas and the R.I.B.A. for allowing the British railways to use the institute building for the exhibition.

Top, winning design; middle, second prize; bottom, third prize

The Work of Railway Police

(See editorial article on page 835)

Mr. G. Stephens, Chief of Police of the Great Western Railway, lectured on "The History and Functions of Railway Police" at a meeting of the Great Western Railway Lecture and Debating Society at Paddington station on November 12. Mr. H. Wheeler (Assistant to the General Manager) presided over an excellent attendance of members.

Having briefly outlined the evolution of railway police and explained the extent of their powers, Mr. Stephens dealt with the Great Western force which, he said, comprised some 360 officers and men. For administrative purposes the line was divided into four divisions, with divisional headquarters at Paddington, Bristol, Cardiff, and Birmingham, each division being divided into sub-districts, with a complement of inspectors, sergeants, detectives, and constables. The majority of the present staff of uniform police consisted of constables who had been transferred from the Goods and Traffic Departments, but as vacancies occurred, men of good physique, education, and character, were chosen from hundreds of applicants, irrespective of whether the selected men were already in the railway service or not.

There had not yet been established a training school for railway police recruits, although this matter was at present under consideration. Meanwhile recruits were encouraged and expected to acquire an early knowledge of their powers and duties; to display the qualities of alertness of mind, energy, and discretion; to discharge their duties with civility, and to maintain an equable temper in all circumstances.

Unification of Control

Mr. Stephens referred to the fact that, previous to 1918, the uniformed branch of the Great Western police was under the control of the traffic officers. Unification of the detective and uniform branches under the Chief of Police was then effected, and was attended with immediate success. Detective officers were generally chosen from the uniformed ranks because of aptitude and general inclination for detective work. A wide knowledge of railway operation and accounts was invaluable to railway detectives, in view of the great variety and intricacy of the inquiries it was necessary for them to take up. A railway detective should also have a special knowledge of various classes of criminals, such as travelling thieves, confidence tricksters, cardsharpers, and pickpockets, who from time to time descend upon the railways. Vigilance, energy, and skill, and the habit of keeping his own counsel, were the qualities which led to success in a detective officer.

The lecturer referred at some length to the heavy duties involved in policing the Great Western Railway Company's dock system—the largest in the country. In addition to protecting railway property at the docks, it was necessary to protect vessels in port, and the many privately-owned works, warehouses, and offices in the vicinity of the dock. The open situation of some of the docks, the variety of operations being engaged in, and the presence of a large floating population of seamen and others, were factors which intensified the work and responsibilities of the docks police. The most prevalent offences committed were thefts from vessels, coal thefts, wilful damage by irresponsible youths, and petty pilferages from private works. There were also to be dealt with such troubles as drunkenness and occasional assaults and affrays among seamen and others.

Having outlined certain disciplinary arrangements of the Great Western Railway police force and explained the methods by which any complaints against the members of the force were investigated, Mr. Stephens gave an interesting analysis of the types of delinquents that come under the notice of railway police. These included (1) the habitual or professional criminal, a fully developed and accomplished lawbreaker; (2) the occasional thief or opportunist who, although more normally constituted than the habitual criminal, was a difficult and dangerous person; and (3) the kleptomaniac, suffering from an irresistible tendency to steal, who was also a prevalent and perplexing problem.

Arrest without Warrant

The lecturer explained the conditions under which persons could be lawfully arrested without warrant. Briefly, for felonies there was full power of arrest, but in the case of misdemeanours arrest could be effected without warrant only at the time the offence was committed.

Police activities included protective or preventive work in connection with special events of all kinds, and the escorting of cash and bullion and insured packages.

What were known broadly as petty offences, including such items as wilful damage, theft of stores, trespassing, coat stealing, obstruction on the line, and general offences against the company's bye-laws, engaged a great deal of the attention of the railway police. Prosecutions in such cases numbered about two thousand a year, whilst a further thousand were detected but not prosecuted, on account of the tender age of the delinquents and other special reasons.

Some interesting figures were quoted showing the great diminution of miscellaneous offences since the year 1920, when a wave of minor crime reached its maximum. In that year the company's police dealt with no fewer than 125,000 reports of felony and miscellaneous offences; the comparable figure for last year was 26,000.

The lecturer spoke in terms of high appreciation of the general honesty of the company's staff—but there were unfortunately black sheep in every flock, and the fact had to be faced that some of the company's own people did, occasionally, submit to the temptation to steal or defalcate. Difficulties were often experienced in locating places at which thefts and pilferages took place, but by means of careful records and analysis it was generally found possible to fix upon certain points for special enquiry. Among post-war expedients adopted for minimising and detecting thefts, the practice of sealing vans containing goods of a pilferable character had proved particularly effective. Last year, on the Great Western system, over 300,000 vans were sealed by the company's police and over 110,000 by the Goods Department.

Interesting and Useful work

Not the least interesting part of Mr. Stephens's lecture was his account of a number of specific cases of theft and ticket frauds that had been successfully cleared up by the company's police. Before passing to these, the speaker said he thought it would be admitted that a railway police officer's services to the travelling public and to his employers were great, and that his labours were both onerous and full of interest. The sustained applause at the end of Mr. Stephens's lecture showed that his audience entirely agreed.

An additional feature of great interest was a brief exposition of the finger-print system of identification, by Supt. Batley, of New Scotland Yard, who had kindly come along at Mr. Stephens's invitation. His address, supplemented by illustrative and practical demonstrations, proved a revelation to his audience.

G.W.R. Bridge Reconstruction Plans.—The following bridges are to be reconstructed by the G.W.R.: Five bridges carrying roads over the Fairford branch, namely, at Witney, Alvescot, Lechlade (2), and Fairford; the road bridge over the G.W.R. main line near Ealing Broadway; the bridge carrying the railway over the River Dulais near Newtown; and the viaduct carrying the main line over the public road and private gardens, near Keyham, Plymouth. The following bridges are also being reconstructed by arrangement with the local councils: Road bridges over the railway at Aberdare and Travellers Rest; Capel Llanillterne bridge carrying the Cardiff road over the railway, near Creigiau; Coity bridge at Bridgend; the railway bridge over the public road near Portmadoc; Goodhaven bridge carrying the public road over the railway, near Perranporth; Long Lane overbridge at Crudgington; and the bridge over the Treforest road at Pontypridd.

XUM

L.M.S.R. Six-hour Schedule Trial Runs London-Glasgow-London

(*See editorial article on page* 834)

At the invitation of the London Midland & Scottish Railway, we were privileged to travel by the special train that was run this week between London, Glasgow, and London to a six-hour schedule each way. This return trial run was in no way an attempt to break high speed records and the engine was never let out on down gradients, speed being studiously controlled by brake application in all cases. Moreover there were in all about 50 service speed restrictions that were carefully observed, and although some of these were mere reductions of perhaps 85 to 70 or 75 m.p.h., many others were very severe. The trial was, in fact, a scientific research into the possibilities of running a six-hour train each way with standard engines and rolling stock in ordinary daily service, and into its effects upon the permanent way, and engine and coaching stock. Any speed records established were therefore purely incidental and the main consideration was the comfort of passengers as they will travel if this new schedule comes into force.

Driver T. J. Clark and Fireman T. Fleet on the footplate

The Engine and Train

The engine used was one of Mr. Stanier's fine 4-6-2 four-cylinder locomotives, No. 6201, *Princess Elizabeth*, in charge of Driver Clarke and Firemen Fleet and Shaw (relief), and Mr. R. A. Riddles, Principal Assistant to the Chief Mechanical Engineer, was also on the footplate. The engine is not streamlined and was taken out of ordinary service for these runs. The rolling stock, though new, is of the latest standard type and, as well as being the acme of comfort, ran with the utmost smoothness at all speeds up to 95 m.p.h. The company's dynamometer car was attached, and from it and from the Chief Civil Engineer's Hallade track recording instrument, which was functioning in one of the ordinary coaches, much valuable information has been accumulated, with regard to the running of the locomotive and the behaviour of the coach throughout the 400 miles in each direction. The locomotive was fitted with a Haslar Tel RT835 speed indicator and recorder.

On the down journey the train was made up of six coaches and the dynamometer car weighing in all 225 tons tare. This was handled so comfortably and with such reserve of power that it was decided to attach an additional coach at Glasgow for the return run; the tare load in the up direction therefore totalled 255 tons, or say 260 tons with passengers, crew and stores.

Among the principal officers of the L.M.S.R. on the train were:—

Mr. E. J. H. Lemon, O.B.E. (Vice-President, Railway Traffic Operating and Commercial), Mr. W. V. Wood (Vice-President, Finance and Service), on the outward run only, Mr. W. K. Wallace (Chief Civil Engineer), Mr. S. J. Symes (Acting Chief Mechanical Engineer in the temporary absence of Mr. Stanier), Mr. J. Purves (Assistant to the Chief Mechanical Engineer, Carriages and Wagons), Mr. S. H. Fisher (Assistant Chief Operating Manager), Mr. D. C. Urie (Superintendent of Motive Power) and Mr. H. G. Smith (Personal Assistant to the Vice-President, O. of C.). Lt.-Col. A. H. L. Mount, C.B., C.B.E., R.E. (ret.) (Chief Inspecting Officer of Railways, Ministry of Transport) was also present on both runs.

After a most comfortable down journey in which the 401·4 miles between Euston and Glasgow Central were covered in 5 hr. 53 min. 42 sec.—at an average speed of 68·2 m.p.h. despite so many speed restrictions and, in parts, a very difficult road—thus creating a world record for steam traction, the officers, train staff and guests accompanying the train were entertained at the Central Station Hotel, Glasgow, by the company. At an informal gathering at tea there, at which representatives of the Scottish press were present, Mr. Lemon emphasised that though this was a record-breaking run in point of combined distance and speed, it was mainly a scientific analysis in order to find out what conditions of operating and maintenance must be complied with for a six-hour schedule between London and Glasgow. No attempt had been made to run at high speeds downhill, a maximum of about 90 m.p.h. being aimed at under favourable conditions. On the five occasions when this speed was attained or passed, the brakes had been applied. He pointed out that the many speed restrictions—some as low as 20 or 30 m.p.h.—had been carefully observed, and that this train of ordinary stock had improved on schedule by wonderfully fast hill climbing and acceleration from the above restricted speeds. He instanced the remarkable ascents of the 31·4 miles Carnforth to Shap summit (altitude 916 ft.) in 26¾ min. at an average speed of 70·2 m.p.h., and the 10·0 miles, mostly graded at 1 in 74 to 1 in 81, up to Beattock summit (1,014 ft. altitude) in 9½ minutes. Mr. Lemon explained that railway speeds would have to be increased to combat competitive forms of transport, and this trial run would indicate what alterations would have to be made to secure complete comfort on a six-hour train in all weather and other conditions, and to this end uniformity of speed was their aim.

Train Crew Entertained

Subsequently, at an informal dinner, at which Mr. Ballantyne (Chief Officer for Scotland) and other L.M.S.R. Scottish officers were present, and the train crew were the guests of honour, Mr. Lemon, who was in the chair, congratulated the latter, and asked everyone to drink their healths. He commented upon their maintenance of so remarkably uniform a speed uphill and down, and also upon the comfort and smooth riding of the coaches. He also congratulated Messrs. Symes, Riddles and Purves on their work towards so successful a trial. The toast of "Tom Clarke and his mates" was then drunk with musical honours.

Mr. Wood also spoke, and congratulated the Permanent Way and Operating Departments upon the results of the run. He warmly welcomed Col. Mount, who, he said, was present so that they could show him exactly what they were doing and that speed restrictions were strictly observed. The Chairman also announced that the run

had been made almost entirely with a cut off of 15 per cent., and that the maximum on the ascents to Shap and Beattock were 32 and 37·5 respectively; coal consumption worked out at about 46·8 lb. per mile.

The Runs Described

Turning now to the runs themselves, reference is made to the two skeleton logs opposite. It should be noted, however, that considerations of space preclude the inclusion of a large number of speed restrictions between the stations shown. Nor has it been possible to show the frequent brake applications on the descents from Shap and Beattock Summits in both directions, and on other down grades. The first point to note is that the up run even with 30 tons extra load was faster than the down, thus creating another record, the 401·4 miles being covered in 344 min. 20 sec., or over a quarter-of-an-hour under schedule. Some of the most remarkable achievements on the two runs were the following:—

(1) The climbs: Carnforth—Shap Summit (altitude 916 ft.) 31·4 miles—including long stretches of 1 in 76, 106, &c.—in 26¾ min. at an average speed of over 70 m.p.h., and with speeds of 66 m.p.h. at Greyrigg and 57 at Shap; (2) Beattock—Beattock Summit (altitude 1,014 ft.), 10·0 miles—inclined almost entirely at 1 in 70 to 1 in 80—in 9 min. 31 sec., with a steady minimum of 56 m.p.h.; (3) on the return journey, the 26½-mile climb from Wreay to Shap Summit completed in 22 min. 33 sec., averaging 70·5 m.p.h., though it includes 7 miles of 1 in 125—where the lowest speed recorded was a steady 63 m.p.h., and on the final 1 in 142 it recovered to 67 m.p.h.—despite 30 tons heavier load; (4) on the slightly rising and then dead level grades approaching Crewe, speed fell only from 90 to 87½ m.p.h. on the grades, rose to 90 immediately the level was reached and continued to rise gradually but steadily to 95 m.p.h. on the level, and was still rising when steam was shut off for the Crewe slowing; finally (6) the 15·0 miles Bletchley to Tring, including the rise over the Chilterns, covered in 11 min. 3 sec., at an average speed of over 81 m.p.h., and a minimum of 77½ m.p.h., in spite of a violent side gale and pouring rain.

The locomotive performance and driving and firing obviously leaves little to be desired, and throughout, the running of the coaches was good. A point not to be forgotten is that a 400-mile non-stop run with such sustained high speeds—as well as calling for great endurance from the engine crew—is attainable only with standard engine and coaches designed and maintained according to the very highest standards.

The administration of the L.M.S.R. is therefore to be congratulated, not only upon a six-hour run to and from Glasgow, but upon an improvement on that schedule by a substantial margin and with complete comfort to the occupants of the train.

L.M.S.R. TRIAL RUNS EUSTON–GLASGOW–EUSTON ON NOVEMBER 16 AND 17, 1936

Locomotive: 4-6-2 No. 6201, *Princess Elizabeth.* *Load:* down run, 225 tons; up run, 255 tons tare (260 tons in all).

DOWN RUN ON NOVEMBER 16

Distance miles		Sched. min.	Actual min.	sec.	Speeds‡ m.p.h.
0·0	EUSTON ...	0	0	00	—
5·4	Willesden Jc. ...	8	7	22	66
17·4	Watford ...	18	18	58	80½
31·7	Tring	30	29	57	77
46·7	Bletchley ...	41	40	32	95½/*79
59·9	Roade ...	51	50	55	77
69·7	Weedon ...	—	58	20	82/*70
82·6	RUGBY ...	70	68	30	*35
97·1	NUNEATON...	82	81	08	90/*83
106·5	Polesworth ...	—	88	20	82/*35
110·0	Tamworth ...	95	92	53	67
116·3	Lichfield ...	100	97	40	85/*76
124·3	Rugeley ...	106	103	38	90/*71
133·6	STAFFORD ...	114	111	55	77½/*30
147·6	Whitmore ...	127	123	51	82/*63
153·3	Betley Road ...	—	128	22	93
158·1	CREWE ...	136	133	00	*20
172·5	Acton Bridge	—	144	35	94½/*49
182·1	WARRINGTON	156	153	39	*55
193·9	WIGAN ...	168	165	01	*49
199·7	Coppull ...	—	170	50	‡54
209·0	PRESTON ...	183	179	15	*20
218·5	Garstang ...	191½	188	15	86
230·0	LANCASTER	200	196	42	*57
236·3	Carnforth ...	205	201	38	83½
243·6	Milnthorpe ...	—	206	54	76
249·1	Oxenholme ...	215	211	45	*65
256·2	Grayrigg ...	—	218	10	66
262·2	Tebay	227	223	15	76
267·7	*Shap Summit*	233	228	23	57
281·2	Penrith ...	245	240	11	*53
294·2	Wreay ...	—	250	08	88/*60
299·1	CARLISLE ...	260	255	27	*20
307·7	Gretna... ...	268	263	30	85½/*58
315·8	Kirtlebridge ...	—	270	43	70
324·9	Lockerbie ...	282	277	47	90
338·8	Beattock ...	293	287	43	80
348·8	*Summit* ...	306	297	14	56
362·3	Lamington ...	—	309	30	81/*35
366·0	Symington ...	—	313	20	68
372·6	Carstairs ...	328	319	37	*25
383·1	Law Junc. ...	338	329	48	many slacks
388·5	Motherwell ...	344	336	40	
401·4	GLASGOW ...	360	353	42	

UP RUN ON NOVEMBER 17

0·0	GLASGOW ...	0	0	00	many slacks for curves
12·9	Motherwell ...	16	16	47	
18·3	Law Junc. ...	22	24	31	
28·8	Carstairs ...	33	34	28	
35·4	Symington ...	—	40	33	71½
39·1	Lamington ...	—	43	15	86½/*65
52·6	*Summit* ...	56	54	18	80/67
62·6	Beattock ...	—	62	28	75
76·5	Lockerbie ...	77	72	50	89/77½
93·7	Gretna ...	90	86	12	86½/*45
102·3	CARLISLE ...	97	93	22	85/*20
107·2	Wreay ...	—	99	17	—
120·2	Penrith ...	114	109	18	85/*75
133·7	*Shap Summit*	127	121	50	63/67
139·2	Tebay ...	132	126	18	82/*70
145·2	Grayrigg ...	—	131	25	69
152·3	Oxenholme ...	143	137	21	80/*66
165·1	Carnforth ...	153	147	20	86½/*65
171·4	LANCASTER	158	152	10	72
182·9	Garstang ...	167	161	05	87
192·4	PRESTON ...	175	168	15	*25
201·7	Coppull ...	—	178	05	76/71½
207·5	WIGAN ...	190	182	40	83/*48
219·3	WARRINGTON	202	193	34	77½/*51
227·1	*Weaver Junc.*	209	201	31	79/*56
243·2	CREWE ...	223	213	15	95/*20
253·8	Whitmore ...	233	222	58	81/*65
267·8	STAFFORD	245	234	50	84/*30
277·1	Rugeley ...	253	242	29	80
285·1	Lichfield ...	259	248	41	92
291·4	Tamworth ...	264	253	02	82/*33
304·3	NUNEATON	277	264	38	90
318·8	RUGBY ...	289	276	10	87/*30
331·7	Weedon ...	—	287	15	82/*73
341·5	Roade ...	308	294	38	80
354·7	Bletchley ...	318	304	32	—
369·7	Tring ...	331	315	35	77½
384·0	Watford ...	342	325	45	91/*79
396·0	Willesden ...	352	335	50	*40
401·4	EUSTON ...	360	344	20	—

* Speed reduced for curves, &c.
‡ Max. and min. at or near stations shown.

The Genesis of the West Coast Route

The remarkable performances between London and Glasgow detailed in the foregoing article make fascinating comparison, with the original timings of the West Coast route to Scotland, and also with a notable special newspaper run of 1848.

With the completion of the Caledonian Railway from Beattock to Glasgow and Edinburgh on February 15, 1848, the first through unbroken railway links were made between London and the two Scottish cities, and the West Coast route became an accomplished fact. Passengers could then leave Euston at 10 a.m. (1st and 2nd class only) and arrive at Glasgow at 1.40 a.m. or Edinburgh at 1.30 a.m. the following morning. This was a considerable improvement over the times that came into force on September 10, 1847 (the day the Carlisle—Beattock section of the Caledonian Railway was opened), when, by road coach connections from Beattock off the 10 a.m. train from Euston, Glasgow was reached at 7.33 a.m. and Edinburgh at 6 a.m. On March 1, 1848, a through schedule was introduced by the L.N.W.R., Lancaster & Carlisle, and Caledonian Railways, whereby trains left both London and Glasgow at 9 a.m. and reached the opposite terminus at 10 p.m. Then, on May 1, 1848, an acceleration of 20 minutes reduced the through London—Glasgow time to 12 hr. 40 min., and on July 1 of the same year a further cut of 30 minutes was made, so that the 9 a.m. from Euston arrived in Glasgow at 9.10 p.m. (and Edinburgh at 9 p.m.).

In February, 1848, when the Caledonian Railway had just been completed, but while arrangements for through services between London and Glasgow were still being discussed by the L.N.W.R., Lancaster & Carlisle, and Caledonian Companies, a remarkable achievement was made in connection with a special newspaper express arranged by W. H. Smith & Son to convey the morning newspapers of February 19 containing Lord John Russell's financial statement and the Parliamentary Debate. The route selected was the Midland and Eastern one, via Rugby, York, Newcastle, Berwick, and Edinburgh, and the express left Euston at 5.35 a.m. and reached Glasgow at 3.57 p.m., completing the journey of 472½ miles in 10 hr. 22 min. Stops, &c., amounted in total to about 50 min., including 8 min. occupied in the road journey from Gateshead to Newcastle, and 7 min. from Tweedmouth to Berwick, so that the actual travelling time was reduced to 9 hr. 32 min., or an average rail rate of about 50 m.p.h. An amusing circumstance connected with this working was that the train arrived in Edinburgh an hour-and-a-half, and in Glasgow two hours, before the mails which left London the preceding evening.

The Brick in Railway Engineering

Two papers were read on November 17 to the Ceramic Society in London, one by Mr. T. H. Seaton, of the L.N.E.R., the other by Mr. L. G. B. Rock, of the Southern Railway. Mr. Seaton, who is District Engineer of the Stratford District, mentioned that there were on his district 400 miles of railway, 144 stations and depots, and 1,688 bridges. He went on to describe some of the brick structures dating back to a century ago, for the maintenance of which he was responsible. Where the mortar had remained sound and the brickwork dry, such structures were as good today as when they were built. Where arches built of London stock bricks had had to be repaired the cause had usually been traced to the failure of the mortar. A certain amount of repair or rebuilding work, however, had been necessitated by the use of bricks made out of spoil produced from excavations for branch lines. Such bricks were of a soft red variety with poor wearing qualities. At a later date the blue brindled engineering brick made its appearance and had proved thoroughly satisfactory. The bricks at present in general use were the blue brindled brick, the London stock, the Accrington type red engineering brick, and the Fletton, and Mr. Seaton described their outstanding qualities. During the year ended June, 1936, the numbers of these four types of bricks used on the Stratford District were respectively 240,000, 90,000, 13,000 and 231,000.

Mr. Seaton mentioned experiments carried out by the Building Research Station as to the type of mortar most suitable to a particular type of brick, from which it appeared that a considerable improvement in adhesion might be obtained with certain bricks if a preparation of lime was added to the ordinary 3 to 1 straight sand and cement mortar. The lime was useful in controlling the extraction of the water content from the mortar and to some extent also served to prevent efflorescence on the surface of new brickwork. Describing certain cases of partial failure of brick structures, Mr. Seaton mentioned that it was rare for the brick itself to fail, the trouble was usually due to other causes such as perishing of the mortar, settlement of foundations, or vibration.

A trouble experienced in the London area was the outbreak of fire in tenanted arches, such fires having occasionally completely destroyed the mortar, thereby necessitating the partial or complete rebuilding of an arch. The importance of preventing the percolation of water into brickwork was stressed, and Mr. Seaton described effective waterproof coverings which had been tried. Encouraging results were now being obtained with bitumen sheeting cemented down either with a quick drying bitumen solution or with pure bitumen liquefied by heat. The sheeting was applied in two layers with broken joints and was protected from mechanical wear by 6 in. × 6 in. brindled tiles 1 in. thick, also set in bitumen either as a solution or as a plastic emulsion. Mr. Seaton referred to the paucity of technical data concerning brickwork. Such information as existed was confined almost entirely to crushing strengths, there being no theory of design for brick structures at all comparable with those applied to steelwork or reinforced concrete. As a rule brick structures were liable to err on the side of strength and solidity, but he was nevertheless prepared to affirm that the brick was still for general purposes the most adaptable and convenient of building materials.

Testing of Bricks

Mr. Rock dealt in his paper more specifically with the selection and testing of bricks for railway use, with special reference to Southern Railway practice. He mentioned that for many purposes brindled bricks obtained in the Southern Railway area were of sufficiently good quality to obviate the necessity for obtaining very large supplies of the Staffordshire blue, on which freight charges were high. Another reason for selecting local bricks from makers having sidings on the company's own system was that the business done encouraged reciprocal action on the part of these manufacturers with the result that a fair amount of their brick traffic was given to the company.

After reviewing the physical and chemical properties of the various types of bricks used, Mr. Rock detailed the methods of testing adopted by the Southern Railway, which, in addition to visual inspection, included measurements in accordance with British Standard Specification No. 657, striking pairs of bricks together for a good ringing sound, breaking sample bricks which were tested for hardness, an absorption test, chemical tests to ascertain the percentage of free lime, sulphur or soluble sulphates, a crushing test, and finally a "cementary" test, so called because of the appearance of the plot of ground in which it was carried out. Sample bricks in groups of three were half buried in the ground in an upright position so that the lower half of the brick was subjected to conditions such as were met in foundations, the upper half being exposed to the air on five surfaces. Although years had to elapse in some case before a final conclusion could be arrived at, a few months had sometimes been sufficient to reveal defects.

Metropolitan Graduate and Student Society Dinner

The fourteenth annual reunion dinner of the Metropolitan Graduate & Student Society of the Institute of Transport was held at the Windsor Castle Restaurant, Victoria, London, on November 18. Mr. G. H. Searle, Chairman of the society presided.

Among those present were:—

Sir Cyril Hurcomb, Messrs. A. W. Arthurton, M. F. Barnard, A. L. Castleman, A Winter Gray, R. Kelso, A. E. Kirkus, J. Pike, C. E. R. Sherrington, Roger T. Smith and T. E. Thomas.

Mr. Frank Pick, deputising for Sir Alfred Read, President of the institute, proposed the toast of "The Metropolitan Graduate & Student Society." He said that he came before the society still a student prepared to learn. Learning, however, was not simply the process of accumulating facts. The whole substance of learning was rather the relating of one fact to another. In the same way as a printer with only 26 different letters could print any combination of words, so a man with a comparatively narrow education in facts could build up quite an extensive learning. A railway was a collection of facts. There were, for instance, the permanent way, the signals, the stations, and the distribution of rolling stock. At the head of all there was the management that related these facts one to another. Our minds, like a railway, were an accumulation of facts, and we had to manage them. Mr. Pick thought that a railway provided the basis of what might be called a liberal education. It had revolutionised geography, transformed history, had provided an important chapter in economics, and it was also concerned with science.

Mr. Searle, in reply, spoke briefly of the society's work, the success of which he attributed largely to the efforts of its Honorary Secretary, Mr. C. F. King. He also said that the members of the society looked forward to the time when they would be called upon to play their part in solving the transport problems of the future.

Mr. G. Barker, Vice-Chairman, proposed the toast of the visitors. He made special reference to the fact that Mr. G. F. Sinclair had been appointed by the council of the institute as its representative on the society's committee in the place of Mr. T. E. Thomas, who had done so much for the society in the past. Mr. Sinclair responded, saying that he was greatly impressed by the efficiency of the committee's work.

WATERLOO SIGNALLING, SOUTHERN RAILWAY.—In our editorial article on page 779 last week it was stated that the number of levers in the old "A" box at Waterloo "was 266, exclusive of 4 setting levers." The word "exclusive" should have read "inclusive."

QUESTIONS IN PARLIAMENT

Sloane Square Station

Mr. Goldie on November 18 asked the Minister of Transport when it was proposed to commence the alterations and improvements to Sloane Square station; and whether in the interests of public safety, such alterations would include the lengthening of the platforms so that passengers in the front and rear carriages would no longer be compelled to alight in the tunnels adjacent to the station.

Mr. Hore-Belisha.—The London Passenger Transport Board informs me that it expects to begin the reconstruction of this station and to lengthen the platforms early next year.

Road Licences and Railways

Mr. Hall-Caine asked the Minister of Transport how many applications for "B" licences had been opposed by the railway companies, both initially and on appeal; and how many had been granted and how many refused.

Mr. Hore-Belisha.—Such information as is available is contained in the annual reports of the licensing authorities published in March, 1936, and covering the period up to September 30, 1935.

Workmen's Tickets

Mr. Pritt asked the Minister of Transport how many passengers travelled annually on the railways with workmen's tickets, or cheap day, half-day, or evening tickets; whether he was aware that the railway companies in all such cases stipulated that they shall not be liable for injuries caused by their negligence; and whether, seeing that hardship had been suffered in numbers of cases of persons injured whilst travelling on such tickets, he would introduce legislation to provide that railway companies should not contract out of their liability for negligence in such cases.

Mr. Hore-Belisha.—During 1935, 303,000,000 journeys were made on railways in Great Britain on workmen's tickets and 455,000,000 on day, half-day, or evening excursion tickets. I am awaiting the result of the further examination which the railway companies have undertaken into this matter.

New Railway Works

Mr. Short asked the Minister of Transport whether he could now give a list of the schemes scheduled under the railway agreement upon which work had commenced.

Mr. Hore-Belisha.—Yes, and with the hon. member's permission I will circulate the latest information available to me.

LIST OF WORKS SCHEDULED UNDER THE RAILWAYS (AGREEMENT) ACT, 1935, WHICH HAVE BEEN COMMENCED AT THE JUNE ACCOUNTING PERIOD

(The item numbers in the margin correspond with the numbering of the works set out in the first schedule to the agreement)

Great Western Railway

3.—Barnstaple and Minehead branches; Newquay and Porthcawl.

4.—Works at Plymouth and Penzance (Ponsandane yard) improvements at sundry stations in Devon and Cornwall; improvements at Whitland, Yeovil, Hatton, Pershore, Penmaenpool, Llanbedr, Pensarn, Llandaff, Cemmes Road, Celynen North (new halt), and Paddington (offices).

5.—Works at Brentford, Hockley, Old Oak Common, Plymouth, Pontypool Road, Pantyffynnon, Bourne End, and Swansea.

6.—Work on section of line from Patney to Halt junction.

7.—Work in hand as follows: Fitting restaurant cars with large windows, ventilators, settees, &c.; lengthening articulated stock and provision of independent bogies; converting buffet cars to brake thirds; fitting Cornish Riviera trains with ventilators and screens; remodelling kitchens and pantries in dining cars.

8.—Works in hand include: Extension of automatic train control to sections of line Plymouth–Penzance, Swansea–Fishguard, Wolverhampton–Saltney, and Hereford–Shrewsbury; fitting of engines with automatic train control appliances; additional track circuiting at various places; improved telephones between Paddington, West of England, and Weymouth; improved signalling on Stourbridge extension line.

London Midland & Scottish Railway

1.—All electric rolling stock work has been put in hand; materials ordered for track equipment; orders for cabling and sub-station plant have been placed.

3.—Orders for the whole of the new steam locomotives have been placed.

4.—Orders for the whole of the new carriages have been placed.

5.—Preparation of the scheme is in hand.

6.—Work at Kilwinning junction (signalling alterations) practically complete; track circuiting at various places, materials on order and work commenced; equipment of goods lines for passenger working at Crewe, practically complete.

7.—Reconstruction of Largs passenger station, work well in hand.

London & North Eastern Railway

3.—Running loops at Ranskill and Bawtry, work commenced.

4.—Sidings at Cowlairs completed; additional sidings at Edinburgh have been laid down and washing platforms are in course of erection.

6.—Seven engines and tenders delivered, remainder under construction.

7.—Fifty-five passenger carriages completed, remainder under construction; fifty-one carriages converted from gas to electric lighting.

Southern Railway

1.—(*a*), (*b*), and (*c*). On these three sections of line work is in hand as regards track equipment, high tension and pilot cables; sub-station equipment and electric train equipment.

2.—Work on this portion of new railway is in hand.

G.W.R. 1937 Renewals Programme

The Great Western Railway has announced its 1937 programme of renewals, which includes the construction at Swindon works of 286 locomotives, comprising 25 "Castle," 10 "Hall," 20 "Earl," and 20 "Manor" classes, and 10 0-6-0 standard goods, 50 2-8-2T, 101 2-6-2T, and 50 0-6-0T locomotives.

Of the 294 passengers coaches which are to be built, 174 will be of the new end-vestibule type which have proved popular with the travelling public. These coaches have deep seats, modern upholstery, large observation windows, and improved ventilation. In addition, two new trains of centre vestibuled coaches, designed specially for catering for pleasure parties and the service of meals to as many as 400 passengers at one time, are to be built to meet the growing demand for such facilities. All these coaches will have steel underframes and will be entirely encased in steel, built on a timber framework and fitted with a steel roof; a practice which has been followed by the company since 1922. The programme also includes the construction of 150 horse boxes, 50 eight-wheel trucks, and 6 eight-wheel kitchen cars, making a total of 500 passenger train vehicles.

For freight services, 3,940 new wagons are to be built, of which, 750 will be vacuum fitted for use on express freight services, including 100 of a convertible type for the conveyance of motorcars. At the present time the G.W.R. stock of containers is 1,680, and during the coming year it is intended to construct a further 200. These will consist of four types, namely, insulated, bicycle, large covered, and furniture removal. The whole programme will cost approximately £2,000,000.

NATIONAL OMNIBUS & TRANSPORT CO. LTD.—An extra-ordinary meeting on November 16 resolved to increase the authorised capital from £1,000,000 to £1,250,000 by creating 250,000 ordinary £1 shares. Jointly with the appropriate main-line railways, this company (a subsidiary of Thomas Tilling Limited) controls the Western, Southern, and Eastern National Companies.

NOTES AND NEWS

Assam Railways & Trading Co. Ltd.—The registered offices of this company are now at 154-6, Fenchurch Street, E.C.3.

Trolleybuses to Uxbridge.—On Sunday last, November 15, the London Passenger Transport Board began a service of trolleybuses (Route No. 607) from Shepherds Bush to Uxbridge, replacing tram route Number 7.

Aberdeen Station Hotel Extension.—The Station hotel, Aberdeen, is being extended by the L.N.E.R. by the addition of twelve bedrooms, five stock-rooms, four bathrooms, and so forth. Like all the other bedrooms in this hotel, every room is fitted with a wash hand basin with hot and cold running water. The external walls and floors are of reinforced concrete.

G.W.R. Channel Islands Steamships.—The ss. *St. Julien* and ss. *St. Helier*, on the Great Western Railway Company's cross-channel service between Weymouth and Jersey and Guernsey, are being entirely reconditioned. During this work, opportunity will be taken to remodel the arrangements and provide more accommodation for third class passengers.

New Road and Rail Bridge in Latvia.—The new road and rail bridge across the Dvina at Krustpils, built by H. Braithwaite & Co. Ltd., was opened on November 16 by M. Ulmanis, the Latvian State President, accompanied by Mr. Monson, the British Minister. The bridge is 900 ft. long, and is the highest steel bridge in Latvia. Its construction has required 960 tons of British high-tensile steel.

L.P.T.B. Trustee Company.—The London Passenger Transport Board Trustee Co. Ltd. was incorporated on November 14 "to act as trustees for any fund for the benefit of employees of the London Passenger Transport Board." The nominal capital is £100 in £1 shares and the directors are Messrs P. Ashley Cooper, John Cliff, Sir Edward J. Holland, J. S. Anderson, C. S. Louch, and J. L. Lindsay.

Anglo-Scottish Railways Assessment Authority.—The Anglo-Scottish Railways Assessment Authority gives notice that it proposes to fix as the average net receipts for the five years 1930 to 1934 of the L.M.S.R., £10,934,153 and of the L.N.E.R. £8,300,797. Out of the L.M.S.R. figure it is proposed to apportion £10,200,277 to England and £733,876 to Scotland; and out of the L.N.E.R. figure £7,749,843 to England and £550,954 to Scotland.

Passenger Services Withdrawn since Grouping.—A paper on this subject was read to the Railway Club, at the Royal Scottish Corporation Hall, Fetter Lane, E.C.4, on November 5, by Mr. G. W. T. Daniel. The author began his survey with the closing of three miles of the former Hull & Barnsley Railway into Cannon Street station, Hull, in 1923, and dealt with all four groups and ungrouped and narrow gauge lines.

Representation of Standard Steel Works, U.S.A.—The Standard Steel Works Company, Burnham, Pennsylvania, U.S.A., announces the appointment of Davis & Lloyd, 26, Victoria Street, Westminster, London, S.W.1, as its European representatives effective as from November 15.

Freight Rebates Bill.—A Bill to amend the eleventh schedule to the Local Government Act, 1929, and to make provision for meeting certain liabilities of the Railway Freight Rebates Fund in respect of the period April 1, 1931, to December 31, 1936, was presented on November 17 in the House of Lords by Lord Fermanagh, and read a first time. It will come up for second reading on Tuesday, November 24.

King gives Dinner in G.W.R. Train.—At the end of the first day of his tour in the South Wales distressed area, the King gave a dinner in the G.W.R. train which he is using as his headquarters during his visit. He arrived by train at Llantwit Major station on the morning of November 18, and proceeded by rail to Usk the same evening. Among his guests at dinner in the G.W.R. restaurant car were Mr. Malcolm Stewart and Sir George Gillett.

L.N.E.R. Musical Society's Carol Concert.—The L.N.E.R. Musical Society's annual performance of carols will take place in the Queen's Hall, London, on Saturday, December 19. The society's full symphony orchestra of 100 will take part, as will also the male voice choirs, numbering some 400, drawn from the L.N.E.R. service at Cambridge, Doncaster, Grimsby, Ipswich, Lincoln, London, Norwich, Peterborough, York, and other places served by the company. The soloist will be Laelia Finneberg, whilst a small choir of selected boy choristers from the London Choir School will take suitable parts in the singing of the carols.

Railway Exhibition for Aberdeen Infirmary.—The L.N.E.R. and L.M.S.R. combined last week in holding an exhibition of locomotives and rolling stock at Aberdeen Joint station, in aid of the Aberdeen Royal Infirmary Building Fund. On the two days of the exhibition, November 14 and 15, there were 11,158 visitors, who were able to inspect a well-assorted display of locomotives, passenger, and goods stock of the two companies. Among the engines shown were the former Highland Railway 4-6-0 "Jones Goods," and the Caledonian single No. 123. Modern types included an L.N.E.R. streamlined Pacific and Mikado, and the L.M.S.R. turbine locomotive. A camping coach figured among the numerous examples of rolling stock. Mr. George Mills, Divisional General Manager (Scottish Area), L.N.E.R., presided at the opening, which was performed by the Lord Provost of Aberdeen. A vote of thanks to the Lord Provost was moved by Mr. W. Yeaman, Commercial Manager, Glasgow, L.M.S.R., in the unavoidable absence of Mr. John Ballantyne, Chief Officer for Scotland, L.M.S.R.

San Francisco-Oakland Bay Bridge Opened.—The San Francisco-Oakland Bay bridge, described in our issue of May 25, 1934, was opened on November 12. The bridge is 8¼ miles long, and its longest single span is 2,310 ft. Construction has occupied over three years, costing approximately £15,500,000. The bridge carries motor and tramway traffic between San Francisco and Oakland.

Road Accidents.—The Ministry of Transport return for the week ended November 14 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year:—

	Killed, including deaths resulting from previous accidents		Injured	
England ..	144	(144)	4,177	(3,823)
Wales	6	(2)	190	(150)
Scotland ..	14	(18)	350	(326)
	164	(164)	4,717	(4,299)

The corresponding fatalities for the previous week were 151, compared with 133 for the corresponding period of last year.

New L.N.E.R. Buffet Car Facility.—On Monday last, November 16, the L.N.E.R. placed a buffet car in service on the 8.30 a.m. Grantham to London express. At the moment the facility is an experiment which will be continued until Christmas. If patronage is such as to justify the expenditure, it is the company's intention to provide a new car for this service and to make it a permanent feature of the train. Between now and Christmas the car being used is one of those in service on the L.N.E.R. tourist trains having an exterior finish of green and cream. The car will return on the 3 p.m. train from King's Cross to Peterborough, which conveys through coaches to the Norfolk Coast resorts.

G.W.R. Docks Improvements.—The following improvements are to be carried out at G.W.R. docks: At Newport the movable hoist track at the North Dock which carries Nos. 3 and 4 hoists is to be extended and brought up close to the movable track on which the present No. 6 hoist works, in order to enable three coal hoists to be brought together when necessary and work at the same time in the loading of one vessel; at Swansea the equipment of two-ton portable electric cranes used in the transit sheds for handling heavy packages of tinplates, steel sheets, etc., is being increased by three new cranes. These cranes enable the transfer of heavy packages between truck and shed, and shed and ship to be expeditiously dealt with, thereby obviating delays to vessels.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 46th Week			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,916¼ mls.)						
Passenger-train traffic...	394,000	378,000	+ 16,000	23,035,000	22,461,000	+ 574,000
Merchandise, &c. ...	514,000	496,000	+ 18,000	22,013,000	20,792,000	+1,221,000
Coal and coke ...	259,000	270,000	− 11,000	10,985,000	10,582,000	+ 403,000
Goods-train traffic ...	773,000	766,000	+ 7,000	32,998,000	31,374,000	+1,624,000
Total receipts	1,167,000	1,144,000	+ 23,000	56,033,000	53,835,000	+2,198,000
L.N.E.R. (6,332 mls.)						
Passenger-train traffic...	265,000	260,000	+ 5,000	14,983,000	14,666,000	+ 317,000
Merchandise, &c. ...	361,000	355,000	+ 6,000	14,975,000	14,471,000	+ 504,000
Coal and coke ...	248,000	262,000	− 14,000	10,657,000	10,233,000	+ 424,000
Goods-train traffic ...	609,000	617,000	− 8,000	25,632,000	24,704,000	+ 928,000
Total receipts	874,000	877,000	− 3,000	40,615,000	39,370,000	+1,245,000
G.W.R. (3,746½ mls.)						
Passenger-train traffic...	166,000	155,000	+ 11,000	9,714,000	9,525,000	+ 189,000
Merchandise, &c. ...	201,000	196,000	+ 5,000	8,789,000	8,432,000	+ 357,000
Coal and coke ...	108,000	119,000	− 11,000	4,607,000	4,563,000	+ 44,000
Goods-train traffic ...	309,000	315,000	− 6,000	13,396,000	12,995,000	+ 401,000
Total receipts	475,000	470,000	+ 5,000	23,110,000	22,520,000	+ 590,000
S.R. (2,153 mls.)						
Passenger-train traffic...	254,000	241,000	+ 13,000	14,244,000	13,965,000	+ 279,000
Merchandise, &c. ...	63,500	61,500	+ 2,000	2,894,500	2,845,500	+ 49,000
Coal and coke ...	31,500	34,500	− 3,000	1,410,500	1,366,500	+ 44,000
Goods-train traffic ...	95,000	96,000	− 1,000	4,305,000	4,212,000	+ 93,000
Total receipts	349,000	337,000	+ 12,000	18,549,000	18,177,000	+ 372,000
Liverpool Overhead ... (6½ mls.)	1,187	1,081	+ 106	55,027	54,334	+ 693
Mersey (4½ mls.) ...	4,300	4,064	+ 236	187,258	184,472	+ 2,786
*London Passenger Transport Board ...	567,900	547,800	+ 20,100	11,217,300	10,886,500	+ 330,800
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,585	1,728	− 143	118,977	117,892	+ 1,085
,, ,, goods	489	566	− 77	24,596	23,474	+ 1,122
,, ,, total	2,074	2,294	− 220	143,573	141,366	+ 2,207
†Great Northern pass. (543 mls.)	8,250	8,250	—	497,500	476,900	+ 20,600
,, ,, goods	10,300	10,100	+ 200	434,650	432,250	+ 2,400
,, ,, total	18,550	18,350	+ 200	932,150	909,150	+ 23,000
†Great Southern pass. (2,067 mls.)	26,623	26,574	+ 49	1,649,622	1,597,328	+ 52,294
,, ,, goods	61,864	55,031	+ 6,833	1,923,806	1,800,612	+ 123,194
,, ,, total	88,487	81,605	+ 6,882	3,573,428	3,397,940	+ 175,488

* 20th week. † 45th week.

Forthcoming Events

Nov. 20 (*Fri.*).—Institute of Transport (Leeds Graduate), at City Transport Department, 7 p.m. "The Highway Engineer and Transport," by Mr. F. Lightowler.

L.N.E.R. (London) Lecture and Debating Society, at Dining Club, Liverpool Street Station, E.C.2, 5.45 p.m. "Skyways," by Mr. G. Waters.

Permanent Way Institution (Brighton), at Welfare Room, New England Street, 7 p.m. "Reminiscences of 42 Years Railway Service," by Mr. G. Kellow.

R.O.D., at Trocadero Restaurant, Piccadilly Circus, London, W.1, 7.30 for 8 p.m. Annual Reunion Dinner.

Nov. 21 (*Sat.*).—Permanent Way Institution (Manchester-Liverpool), at L.M.S.R. Ambulance Room, Blackburn Station, 3 p.m. "Faience and Modern Building," by Mr. J. Regan.

Stephenson Locomotive Society (Midlands-Northern), at 4, Bury Old Road, Manchester, 6.30 p.m. General Meeting.

Nov. 23 (*Mon.*).—Institute of Transport (London), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. Brancker Memorial Lecture: "Some Aspects of the Organisation of the Empire's Airways," by Mr. D. Handover.

Institution of Electrical Engineers, Savoy Place, London, W.C.2, 7 p.m. Discussion: "Electric Vehicles—Some Technical Aspects."

Nov. 24 (*Tues.*).—Institute of Transport (Birmingham Graduate), at Imperial Hotel, 6.30 p.m. "Building a Railway Engine," by Mr. P. Chilcott.

Institution of Locomotive Engineers (Manchester), at 36, George Street, 7 p.m. "Hydraulic Transmission for Railcars," by Dr. H. Haworth.

Nov. 25 (*Wed.*).—Institute of Fuel (London), at Chemical Society, Burlington House, Piccadilly, W.1, 6 p.m. "A Method of Measuring the Performance of the Locomotive Boiler," by Dr. P. Lewis-Dale; "The Analysis of Flue Gases in the Locomotive Boiler by Electrical Conductivity Meters," by Messrs. V. Binns and S. Bairstow.

Institution of Locomotive Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. "Locomotive Feed-Water Treatment," by Mr. J. Hancock.

Institution of Railway Signal Engineers, at Inst. of Electrical Engineers, Savoy Place, London, W.C.2, 6 p.m. "How Telephones Assist in Railway Working," by Mr. W. Green.

L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Inst., 7.30 p.m. "Railway Advertising," by Mr. C. Dandridge.

Nov. 27 (*Fri.*).—Institute of Transport (Manchester-Liverpool), at Exchange Station Hotel, Liverpool, 6.30 p.m. Visit of the President.

British and Irish Railways Stocks and Shares

Stocks	Highest 1935	Lowest 1935	Prices Nov. 18, 1936	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	44½	63	+3
5% Con. Prefce ...	124	108	125	—
5% Red.Pref.(1950)	117	106¾	110½	—
4% Deb.	118½	108	115	−½
4½% Deb. ...	122	110	119½	—
4½% Deb. ...	129½	118	127½	—
5% Deb.	140¼	130	138½	—
2½% Deb. ...	82¼	68½	76½	—
5% Rt. Charge ...	137	128	135½	—
5% Cons. Guar. ...	136¾	120½	133½	—
L.M.S.R.				
Ord.	25516	16	34	+1½
4% Prefce. (1923)	58¼	43½	80½	+½
4% Prefce. ...	87½	73½	91½	+½
5% Red.Pref.(1955)	107	97¾	108½	—
4% Deb.	110¼	99½	110½	—
5% Red.Deb.(1952)	119116	111516	116½	—
4% Guar. ...	105⅝	95½	105½	—
L.N.E.R.				
5% Pref. Ord. ...	15⅞	8¼	12½	+¼
Def. Ord. ...	7916	4¾	6¼	—
4% First Prefce.	74¾	48	78½	—
4% Second Prefce.	31¾	16¼	30	−½
5% Red.Pref.(1955)	92¼	71	99	—
4% First Guar. ...	103116	93	102	—
4% Second Guar.	98¾	82½	98	—
3% Deb.	86	75	84½	+½
4% Deb.	109¼	98½	108½	—
5% Red.Deb.(1947)	118¼	106½	112½	—
4½% Sinking Fund Red. Deb.	112½	108	110½	—
SOUTHERN				
Pref. Ord. ...	87½	69¾	98	+½
Def. Ord. ...	25116	16¾	27	+½
5% Prefce. ...	124	108¼	125	—
5% Red.Pref.(1964)	117¾	109½	117½	—
5% Guar. Prefce.	136½	121½	133½	—
5% Red.Guar.Pref. (1957)	121¼	112½	117½	—
4% Deb.	116¾	107	113½	—
5% Deb.	138	130¼	137½	—
4% Red. Deb. 1962–67	115	106½	112½	—
BELFAST & C.D.				
Ord.	9	4	5⅛	+⅛
FORTH BRIDGE				
4% Deb.	111¼	104¼	105½	—
4% Guar. ...	109⅞	104	105½	—
G. NORTHERN (IRELAND)				
Ord.	20	7	12	+¾
G. SOUTHERN (IRELAND)				
Ord.	57½	14½	54	—
Prefce.	50	25¼	62½	+2½
Guar.	88¾	51¼	95½	+5½
Deb.	86¼	70	99½	+½
L.P.T.B.				
4½% "A" ...	130	119¾	126½	—
5% "A" ...	139¾	130	136½	—
4½% "T.F.A." ...	113¾	108	111	—
5% "B" ...	131½	122¾	129½	—
"C"	109½	91	98	+1
MERSEY				
Ord.	23⅛	9¼	38½	+1½
4% Perp. Deb. ...	100½	93½	101	+1
3% Perp. Deb. ...	75½	67	76½	—
3% Perp. Prefce.	62	47¼	67½	—

XUM

CONTRACTS AND TENDERS

The Gloucester Railway Carriage & Wagon Co. Ltd. has received an order from the London Passenger Transport Board for ten 30-ton bogie flat wagons; ten 20-ton bogie rail wagons; and five four-wheeled hopper wagons.

Locomotive for Sierra Leone

Beyer Peacock & Co. Ltd. has received a repeat order from the Sierra Leone Development Co. Ltd. for one 3-ft. 6-in.-gauge Beyer-Garratt 2-8-2 + 2-8-2 articulated locomotive.

The Fairfield Shipbuilding & Engineering Co. Ltd. has received an order from the War Office for nine flat-topped four-wheeled wagons and one four-wheeled well-wagon.

Locomotives for India.

The Skoda Works has received an order through Carters (Merchants) Limited for four I.R.S. Class YK 2-6-0 superheated locomotives and tenders for service on the metre-gauge lines of the Assam-Bengal Railway and to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

J. J. Beijnes, of Haarlem, has in hand an order for 74 motor-coaches for the Amsterdam–Eindhoven and Hague–Arnhem lines of the Netherlands Railways, which are being electrified. The contract price is understood to be about 3,500,000 florins.

Ransomes & Rapier Limited has received an order from the War Office for two 35-ton steam breakdown cranes.

Stewarts and Lloyds Limited has received an order from the Central Argentine Railway for 3,000 non-corrosive galvanised solid drawn steel boiler tubes.

H. J. Skelton & Co. Ltd. has received an order from the South Indian Railway Administration for approximately 10 tons of steel bars and sections and 2,160 tinned sheets to be supplied to the inspection of Messrs. Robert White & Partners.

Craven Brothers (Manchester) Limited has received an order from the Indian Stores Department for one 4-ft. 9-in. portable, universal radial drilling and tapping machine.

Alfred Herbert (India) Limited has received an order from the Indian Stores Department for one high-speed vertical drilling, boring, tapping and studding machine and three 4 ft. 6 in. centralised control radial drilling, boring and tapping machines, motor driven.

Taylor Bros. & Co. Ltd. has received an order from the Peruvian Corporation for 52 pairs of wheels and axles required for bogie covered goods wagons.

N. V. Werkspoor, of Amsterdam, has received from the Netherlands Railways an order for eight 300-b.h.p. diesel-mechanical railcars. Five cars will be fitted with two 150-b.h.p. engines made by Stork Bros. of Henglo, and three with engines of similar power built by the Thomassen Company. Mylius mechanical transmission has been ordered for all eight vehicles.

G.W.R. 1937 Renewal Programme

The G.W.R. has announced a renewal programme for 1937 to cost approximately £2,000,000, and to which full reference is made on page 869. The programme covers construction at Swindon of a total of 286 locomotives, 294 passenger coaches, 150 horse boxes, 50 eight-wheeled trucks and six eight-wheeled kitchen cars, thus totalling 500 passenger train vehicles, while an additional 3,940 new wagons are also provided for. Of these wagons, 750 will be vacuum fitted. The company's container stock is to be increased by a further 200. In addition to this, the G.W.R. has announced a docks programme including additional cranage facilities; this is referred to in a paragraph on page 870

The General Electric Co. Ltd. has received a contract from the L.N.E.R. for a three years' supply of Osram lamps.

Boilers for S. America and India

The North British Locomotive Co. Ltd. has received an order from the Cordoba Central Railway for 10 boilers for Class C7 locomotives.

The North British Locomotive Co. Ltd has also received an order from the Mysore State Railways for two superheated boilers for HPS. class 4-6-0 passenger locomotives to the inspection of Messrs. Rendel, Palmer & Tritton.

The Associated British Machine Tool Makers Limited has received an order from the Indian Stores Department for an axle journal returning, burnishing, and wheel boss facing machine with electrical equipment.

The Argentine State Railways Administration is proposing to purchase 50 diesel railcars, and has asked Congress to sanction the expenditure of $5,000,000 paper for this purpose.

Ganz & Co., of Budapest, has received orders from the Buenos Ayres Pacific Railway for the supply of six Gang–Jendrassik oil engines and Ganz mechanical transmissions, six sets of railcar mechanical equipment, and for the design and part supply of six railcar bodies.

A contract worth 12,000,000 R.M. will be signed in the next few days by Mr. Kato, the Manchukuan Trade Commissioner in Berlin, and a German concern for the supply of an oil-from-coal plant to Manchukuo, and a number of other major transactions is under consideration, including supplies for Manchukuo of locomotives and blast furnaces, states a Reuters Berlin message.

Cowans Sheldon & Co. Ltd. has received an order from the L.N.E.R. for one 70-ft. articulated turntable to be installed at the Southend locomotive depot.

The Bombay, Baroda & Central India Railway Administration has placed the following orders to the inspection of Messrs. Rendel, Palmer & Tritton:—

Steel, Peech & Tozer Limited, 150 carriage and wagon tyres.

Tubes Limited, 1,000 steel boiler tubes.

American Car, Foundry & Export Co. Ltd., air conditioning and cooling equipment for one bogie tourist coach.

Telefonaktiebolaget L. M. Ericsson has received an order from the Egyptian State Railways Administration for a quantity of telephone cords to a total approximate cost of £1,686 delivered f.o.b. Stockholm (Ref. No. E.S.R. 334. G3/19.)

The English Steel Corporation has received an order from the Madras & Southern Mahratta Railway for eight locomotive crank axles to be supplied to the inspection of Messrs. Rendel, Palmer & Tritton.

The Crown Agents for the Colonies have recently placed the following orders:—

A.B.C. Coupler & Engineering Co. Ltd., A.B.C. coupler spares.

Turners Asbestos Cement Company, asbestos sheets.

G. & J. Weir Limited, boiler feed pumps.

P. & W. MacLellan Limited, boiler plates and steelwork.

T. White & Sons Limited, boring machine.

Stanton Ironworks Co. Ltd., cast-iron pipes.

Dorman Long & Co. Ltd., Chromador steel deck bridges and steelwork.

Wolverhampton Corrugated Iron Co. Ltd., corrugated sheets.

British Insulated Cables Limited, d.c. telephone cable.

Churchill Machine Tool Co. Ltd., grinding machine.

Kitchen & Wade Limited, machine tools.

G. Kent Limited, meters and spares.

J. Walsh & Co. (Birmingham) Ltd., mild steel angles.

Whitehead Iron & Steel Co. Ltd., mild steel bars and mild steel rods.

Colthurst & Harding Limited, paint.

Stewarts and Lloyds Limited, steel piping.

Ferguson Pailin Limited, switchgear.

Bellis & Morcom Limited, turbo alternator set.

Ward, Haggas & Smith, wheel lathe.

Leyland Motors Limited has received the following orders from railway-associated road transport operators:—

Dublin United Tramways (1896) Limited, components for 50 chassis of which 35 are to be Titan double-decked type and the remainder Leyland Lion single-decked type. All the chassis will be fitted with Leyland direct-injection oil engines.

Western Australia Government Tramways, 14 trolleybuses to be fitted with G.E.C. equipment.

W. Alexander & Son Limited, 25 oil-engined Tigers.

Ribble Motor Services Limited, two Tigers.

The Controller of Stores, G.I.P. Railway, Lower Parel, Bombay, invites tenders, receivable by December 7, for the supply of a quantity of E type fish-plates for 100-lb. bull-headed rails.

Tenders are invited by the Assam-Bengal Railway Administration, receivable by December 9, at 56, Victoria Street, Westminster, S.W.1, for one boiler required for YD/1 Class 2-8-2 locomotive and one boiler for YD/2 Class 2-8-2 locomotive.

The Chief Controller of Stores, Indian Stores Department (Electrical Section), New Delhi, invites tenders, receivable by December 8, for one 10-ton metre-gauge hand-operated travelling jib crane

OFFICIAL NOTICES

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite Tenders for :—

(*a*) 5,330 STEAM BOILER TUBES, 120 STEEL FLUE TUBES AND 16 STEEL ARCH TUBES.

(*b*) 382 STEEL TYRES FOR LOCOMOTIVES AND 400 STEEL TYRES FOR CARRIAGES AND WAGONS.

(*c*) 29,000 TIE BARS FOR POT SLEEPERS.

Specifications and Forms of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, London, S.W.1.

Fee ONE GUINEA each *which will not be returned.*

Tenders for (*a*) Tubes and (*b*) Tyres must be submitted not later than 2 o'clock p.m. on TUESDAY, 8TH DECEMBER, 1936, and Tenders for (*c*) Tie Bars not later than 2 o'clock p.m. on TUESDAY, 15TH DECEMBER, 1936.

The Directors do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
G. W. V. DE RHE PHILIPE,
Secretary.

Universal Directory of Railway Officials and Railway Year Book

42nd Annual Edition, 1936-1937

Price 20/- net.

This unique publication gives the names of all the principal railway officers throughout the world, together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

THE DIRECTORY PUBLISHING CO. LTD.
33, Tothill Street, London, S.W.1.

and five 5-ton metre-gauge hand-operated jib cranes, required for the Eastern Bengal Railway.

The Agent, Burma Railway, Rangoon, invites tenders, receivable by January 7, 1937, for the supply of permanent way and signalling materials required for 1937-38.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites tenders, receivable by December 7, for supply of axles, tyres and wheels required for the E.B., G.I.P., E.I. and N.W. Railways.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, invites tenders, receivable by December 7, for the supply of 10 self-indicating dormant platform weighing machines required for the G.I.P. Railway.

Tenders are invited by the Chief Controller of Stores, Indian Stores Department (Engineering Section), New Delhi, receivable by December 10, for the supply of a total of 4,050 boiler smoke tubes required for the East Indian Railway at Howrah General Stores, Salkea.

COUNTY MOTORS (LEPTON) LIMITED.—The authorised capital has been doubled, 15,000 ordinary £1 shares having been added to the previous figure of £15,000.

BIRMINGHAM & MIDLAND MOTOR OMNIBUS CO. LTD.—The authorised capital has been increased by 175,000 ordinary £1 shares from £1,150,000 to £1,325,000.

HALF-FARES FOR VISITORS TO PARIS INTERNATIONAL EXHIBITION.—The Annual Conference of Tourist Agents has agreed upon a 50 per cent. reduction of railway fares in France for visitors from abroad to the 1937 International Exhibition in Paris. The reductions will be in force for six months, and will apply to all visitors making a stay of five days or over.

BRISTOL TRAMWAYS & CARRIAGE CO. LTD.—On November 30 the shareholders are to be asked to sanction an increase in the authorised capital from £2,000,000 to £2,200,000 by the creation of 200,000 ordinary £1 shares. The purchase of the Bath Tramways group, to which we referred on page 661 of our issue of October 23, has been accepted by the requisite number of Bath shareholders and the deal is being completed.

RAILWAY AND OTHER REPORTS

North Western of Uruguay Railway.—Gross receipts for the year ended June 30, 1936, amounted to $252,150 (against $234,488 for 1934–35), and net receipts to $6,420 (against a loss of $21,628). After crediting miscellaneous income and charging debenture interest, &c., the debit balance carried forward is increased from £44,699 to £58,490. The operating ratio in sterling was 96·75 per cent., compared with 107·17 per cent. in 1934–35. The moratorium agreed to by the debenture stockholders of the company and the Quarahim International Bridge Co. Ltd. was extended by the debenture-holders committee to December 31, 1936.

North Eastern of Uruguay Railway.—The scheme of arrangement of 1933, under which payment of one half of the rent of £56,000 due from the Central Uruguay Railway Company to the North Eastern Company under its lease, was postponed for three years, was last year modified by a further scheme embodying a complete postponement of the payment of the entire rent for the year ending September 30, 1936, or for a further year should the stockholders' committee so decide. The report for the year ended June 30, 1936, states that the committee has extended the moratorium until September 30, 1937. Meanwhile there is under consideration a scheme of reorganisation of the North Eastern and its allied companies and a reconstruction of capital. The company's railway of 76 miles is leased to the Central Company until July 1, 2888.

Argentine North Eastern Railway.—Gross receipts in the year ended June 30 last rose from £585,507 for 1934-35 to £620,234, taken at par of exchange, the increase being due principally to improved passenger, fruit, and general goods traffic. Working expenses were almost unchanged, the net receipts being higher by £34,806 at £155,572. The operating ratio was 74·92 per cent., against 79·37 per cent. The loss on exchange, however, was £5,931 larger at £53,441. After allowing for this and debiting interest in respect of the prior lien, A and B debenture issues (although that on the B debenture capital has been postponed in accordance with resolutions passed by holders), and providing for sundry other items, there is shown a debit balance for the year of £40,175, against £59,305. The accumulated debit balance now carried forward is £248,648. No allocation to renewals reserve has been made in the year under review.

Pennsylvania Railroad.—The company has declared a dividend of $1·00, and the announcement stated that it would be paid on the 1936 earnings. The last dividend, also $1·00, was paid on February 29, 1936. Expecting track improvements in 1937, in view of the increased volume of traffic, the company has purchased 100,000 tons of steel rails. The deal is said to involve approximately $4,000,000, and is the largest order placed by the company since 1933.

Samuel Osborn & Co. Ltd.—The report shows a balance of profit, £39,763, against £34,473. The dividend proposed is 10 per cent., making 12½ per cent. for the year, against 7 per cent., and the amount to be carried forward is £36,455, against £31,956.

Chloride Electrical Storage Co. Ltd.—The directors announce an interim dividend of 5 per cent. on the A and B ordinary shares, the same as a year ago. Trading results of the company and associated companies continue satisfactory so far this financial year.

Associated Equipment Co. Ltd.—The directors recommend a final dividend of 13d. a unit of £1 stock, free of tax (against 10d. a unit, free of tax, a year ago), making a total dividend for the year of 18d. a unit of £1 stock (against 15d.), free of tax, which is approximately equal to 9⅙ per cent., subject to tax, against 8⅓ per cent.

Dorman Long & Co. Ltd.—The directors announce a dividend of 6¼ per cent. on the non-cumulative first preference shares, and a dividend of 8 per cent. on the non-cumulative second preference 8 per cent. shares, and an additional 6 per cent. on the preferred ordinary and 6 per cent. on the ordinary shares for the year ended September 30, 1936. All dividends are less tax and payable on January 1.

Forthcoming Meetings

Nov. 23 (*Mon.*)—**Argentine North Eastern Railway Co. Ltd.** (Ordinary General), River Plate House, Finsbury Circus, E.C., at 2.30 p.m.

XUM

Railway Share Market

Railway stocks generally have been active at higher prices. This is partly a reflection of the continued strength of the stock and share markets, but there were special factors which induced increased interest in railway stocks. Those of the Home railways were influenced favourably by the growing anticipations that developments are impending whereby distributions will be forthcoming over a period of years in respect of the overpayment of rates by the railways in the past. Most of the junior stocks were in much larger demand.

A slightly easier trend developed on Wednesday following the traffic figures for the past week, although the latter were expected again to show only small increases because comparison is still with the period last year when there were exceptionally large movements of coal. Had it not been for a decline in receipts from coal, the past week's returns would have been quite favourable, as figures for both passengers and goods show satisfactory increases. Great Western ordinary was higher at 62¼, aided by the belief that the South Wales coal trade will benefit a good deal from the resumption of coal exports to Italy. L.M.S.R. ordinary was strong at the higher level of 34 on the relatively good traffic increase of £23,000 (once again the railway's traffics show the largest gain) and on the view that if any early distribution in respect of overpaid rates is contemplated, the possibility of a dividend of 1½ per cent. on the ordinary stock will be increased. Both the 4 per cent. and 1923 preferences were again higher. The L.N.E.R. preference stocks also participated in the upward movement, as did the deferred and preferred, but an easier trend developed when it became known that last week's traffics show a decrease of £3,000. Southern deferred was strong up to 27 on satisfaction with the rise of £12,000 disclosed by the past week's receipts. London Transport "C" stock remained out of favour.

A strong outburst of activity was shown by Argentine railway stocks, largely owing to a wider realisation that indications point to recovery in trade conditions in the Argentine being accelerated during the next twelve months. At one time Central Argentine, which continued to benefit from satisfaction with the statements at the recent meeting, reached 24½. B.A. Pacific touched 12½, and B.A. Great Southern 26, but best prices were not held. Preference stocks responded to the upward movement and many of the debentures established gains ranging up to 4 points as compared with a week ago. Cordoba Central debentures were strong. Elsewhere Antofagasta and Leopoldina improved and San Paulo recovered several points. Canadian Pacific issues developed a somewhat easier trend.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1935-36	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1935	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1935	Prices: Lowest 1935	Prices: 3/11/36	Prices: Yield (See Note)
South & Central America.	Antofagasta (Chili) & Bolivia	834	15.11.36	£ 16,140	£ 2,830	46	£ 631,200	£ 571,790	£ 59,410	Ord. Stk.	23	14 15/16	24	Nil
	Argentine North Eastern	753	14.11.36	9,835	1,627	20	187,349	164,989	22,360	"	7	4	8	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	49 1/2	30	50	8
	Bolivar	174	Oct., 1936	5,900	600	44	63,600	60,600	3,000	6 p.c. Deb.	13	5	7 1/2	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	14	11	16	3
	Buenos Ayres & Pacific	2,806	14.11.36	80,412	7,557	20	1,499,282	1,472,897	26,385	Ord. Stk.	10 1/2	4 7/8	12 1/2	Nil
	Buenos Ayres Central	190	31.10.36	$164,400	$37,900	18	$2,520,800	$2,251,300	$269,500	Mt. Deb.	21	10	30	Nil
	Buenos Ayres Gt. Southern	5,084	14.11.36	124,176	11,250	20	2,212,843	2,375,049	162,206	Ord. Stk.	27	13 1/2	26	Nil
	Buenos Ayres Western	1,930	14.11.36	46,000	877	20	803,114	783,405	19,709	"	24	10	23 1/2	Nil
	Central Argentine	3,700	14.11.36	139,869	23,485	20	2,749,129	2,355,517	393,612	"	17 7/8	7	24 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	9	3 1/4	12	Nil
	Cent. Uruguay of M. Video	273	7.11.36	14,253	1,238	19	214,399	170,390	44,009	Ord. Stk.	8 1/2	3	5	Nil
	Do. Eastern Extn.	311	7.11.36	2,687	600	19	33,724	26,895	6,829	—	—	—	—	—
	Do. Northern Extn.	185	7.11.36	1,487	1	19	25,925	21,175	4,750	—	—	—	—	—
	Do. Western Extn.	211	7.11.36	1,027	224	19	18,428	14,205	4,223	—	—	—	—	—
	Cordoba Central	1,218	14.11.36	28,350	1,440	20	643,960	618,350	25,610	Ord. Inc.	4	1	3	Nil
	Costa Rica	188	Sept., 1936	14,195	882	9	52,763	43,715	9,048	Stk.	35	30	36	5 9/16
	Dorada	70	Oct., 1936	15,100	3,200	44	141,700	117,400	24,300	1 Mt. Db.	103 5/8	102 1/2	104 1/2	5 1/4
	Entre Rios	810	14.11.36	13,341	2,977	20	251,390	233,547	17,843	Ord. Stk.	15	6 1/2	13	Nil
	Great Western of Brazil	1,082	14.11.36	11,800	1,900	46	356,000	349,500	6,500	Ord. Sh.	1/2	5/16	1/4	Nil
	International of Cl. Amer.	794	Sept., 1936	$305,126	$20,883	40	$3,929,758	$3,549,254	$386,504	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	1/2	5/32	1/2	Nil
	La Guaira & Caracas	22¾	Oct., 1936	4,305	1,405	43	45,850	37,885	7,965	Stk.	8 1/2	8	5 1/2	Nil
	Leopoldina	1,918	14.11.36	24,649	5,617	46	899,984	819,735	80,249	Ord. Stk.	8 1/2	2 1/2	6 1/2	Nil
	Mexican	483	14.11.36	$309,700	$53,200	20	$5,089,700	$4,830,300	$259,400	"	1 1/2	1/4	5/4	Nil
	Midland of Uruguay	319	Oct., 1936	8,771	2,167	18	32,198	22,939	9,259	"	1 1/2	1 1/2	1/2	Nil
	Nitrate	397	15.11.36	6,018	2,145	46	107,905	130,837	22,932	Ord. Sh.	64/-	42/-	2 5/8	Nil
	Paraguay Central	274	7.11.36	$2,381,000	$336,900	19	$48,671,000	$41,080,000	$7,591,000	Pr. Li. Stk.	80 1/2	60	78 1/2	7 5/8
	Peruvian Corporation	1,059	Oct., 1936	82,005	112	18	339,051	299,665	39,386	Pref.	10 5/8	6 7/16	11	Nil
	Salvador	100	14.11.36	c16,200	c5,849	20	c222,011	c236,948	c14,937	Pr. Li.Db.	65	61	15	Nil
	San Paulo	153½	8.11.36	25,442	843	45	1,315,602	1,192,417	213,185	Ord. Stk.	80	35	84	3
	Taltal	164	Oct., 1936	3,665	275	17	12,420	12,640	220	Ord. Sh.	1 1/16	1 1/8	1 1/8	8 7/8
	United of Havana	1,353	14.11.36	14,139	1,642	20	305,450	316,858	11,408	Ord. Stk.	3 1/16	1	2 1/2	Nil
	Uruguay Northern	73	Oct., 1936	1,162	381	18	3,751	2,578	1,173	Deb. Stk.	4 1/2	2 15/16	5 1/2	Nil
Canada.	Canadian National	23,613	7.11.36	783,585	53,740	45	31,430,503	29,321,062	2,109,441	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—	4 p.c. Perp. Dbs.	78 5/8	52 1/2	75 1/2	5 3/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	103 5/8	93	103 1/2	3 7/8
	Canadian Pacific	17,220	14.11.36	561,000	31,000	46	24,004,200	22,349,200	1,655,000	Ord. Stk.	14 1/16	8 5/8	15	Nil
India.†	Assam Bengal	1,329	20.10.36	43,612	4,949	29	693,327	665,012	28,315	Ord. Stk.	92 1/8	77 1/2	86 1/2	3 7/16
	Barsi Light	202	20.10.36	1,687	818	29	63,855	77,040	13,185	Ord. Sh.	105	77 1/2	66 1/2	7 1/2
	Bengal & North Western	2,112	31.10.36	75,232	8,702	5	214,644	190,673	23,971	Ord. Stk.	30 11/2	291	311	5 1/8
	Bengal Dooars & Extension	161	20.10.36	4,873	183	29	73,669	75,149	1,480	"	12 7 1/2	122	12 2 1/2	5 11/16
	Bengal-Nagpur	3,268	31.10.36	169,800	24,455	30	3,476,686	3,697,877	221,191	"	105	100 5/16	102 1/2	3 7/8
	Bombay, Baroda & Cl. India	3,072	10.11.36	225,225	7,650	32	4,923,825	4,745,400	178,425	"	11 5 1/4	110	11 2 1/2	5 5/16
	Madras & Southern Mahratta	3,229	20.10.36	118,725	20,938	29	2,971,191	2,971,070	121	"	12 8 1/2	11 3 7/8	11 2 1/2	8
	Rohilkund & Kumaon	572	31.10.36	12,947	1,015	5	35,646	33,523	2,123	"	294	262	311	5 1/8
	South Indian	2,532	20.10.36	116,045	9,634	29	2,258,336	2,255,128	3,208	"	11 9 5 4	10 4 1 4	10 3 1 2	5 5/16
Various.	Beira-Umtali	204	Aug., 1936	73,900	3,933	48	719,218	710,272	8,946	—	—	—	—	—
	Bilbao River & Cantabrian	15	Sept., 1936	1,639	478	40	13,631	13,358	273	—	—	—	—	—
	Egyptian Delta	620	31.10.36	10,271	1,766	30	138,948	133,573	5,375	Prf. Sh.	2	1 5/8	1 5/4	5 11/16
	Great Southern of Spain	104	29.8.36	568	2,514	35	33,629	62,623	28,994	Inc. Deb.	3 1/2	2	3 1/2	Nil
	Kenya & Uganda	1,625	Oct., 1936	181,657	11,959	44	2,129,052	2,003,110	125,942	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	48	36	46 1/2	7 1/2
	Mashonaland	913	Aug., 1936	112,733	4,955	48	1,131,918	1,277,362	145,444	1 Mg. Db.	10 4 1/4	100	103	4 7/8
	Midland of W. Australia	277	Sept., 1936	14,970	820	13	36,835	37,203	368	Inc. Deb.	98 3/4	93	95	4 5/16
	Nigerian	1,905	26.9.36	29,153	10,649	26	755,019	594,657	160,362	—	—	—	—	—
	Rhodesia	1,538	Aug., 1936	207,304	4,235	48	2,075,634	2,126,923	51,289	4 p.c. Db.	105 1/2	101	105	3 13/16
	South African	13,263	24.10.36	659,855	76,747	29	17,975,242	16,507,963	1,467,279	—	—	—	—	—
	Victoria	4,728	June, 1936	703,693	16,855	52	9,689,925	9,421,092	268,833	—	—	—	—	—
	Zafra & Huelva	112	Sept., 1936	6,666	6,193	39	65,948	101,435	35,487	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value.